



HYPERTENSION HEADACHES EFFECTIVELY RELIEVED

THREE out of four patients with headache due to high blood-pressure can be relieved effectively by administration of *Viscum album* (European mistletoe). This was proved by the work of O'Hare and Hoyt (*New England J. Med.*, 199: 1207, 1928) in a series of 100 cases.

Hypotensyl is the preparation which combines *Viscum album* (European mistletoe) with hepatic and insulin-free pancreatic extracts, thereby enhancing its effectiveness by synergistic action. A single dose often lowers blood-pressure 20 to 30 mm. Hg. in 4 hours.

It gives good results in cases of essential hypertension, benign hyperpiesia, fibrotic kidney and hypertension accompanying pregnancy.

The average dose is 3 to 6 tablets daily, one-half hour before meals. Treatment should be continued for two to three weeks, with a week's interval between courses.

Hypotensyl is supplied in bottles of 50 and 500 tablets. We shall be glad to send you a complimentary sample on request.

HYPOTENSYL

Lowers High Blood-Pressure

THE ANGLO-FRENCH DRUG COMPANY

354 St. Catherine Street East

Montreal, Quebec

The Canadian Medical Association Journal

Editor, A. G. NICHOLLS, M.A., M.D., D.Sc., F.R.S.C., F.R.C.P.(C.)
3640 University Street, Montreal

Vol. 31

JUNE, 1936

No. 6

Contents

	Page		Page
Index	I	Tuberculosis and the Student Nurse. <i>R. J. Collins and C. W. MacMillan</i>	649
The Histology of the Thyroid Gland in Pregnancy. <i>A. C. Abbott and J. Prendergast</i>	609	The Sedimentation Test in Pulmonary Tuberculosis. <i>A. H. Duncan</i>	655
Hypertrophy of the Palpebral Tarsus, the Facial Integument and the Extremities of the Limbs Associated with Widespread Osteo-Periostosis: a New Syndrome. <i>J. N. Roy</i>	615	The Physician and Modern Dietetics. <i>M. A. Bridges</i>	659
The Surgical Treatment of Chronic Radiation Dermatitis. <i>S. Gordon</i>	622	Observation on the Use of Iron Preparations in the Treatment of Anæmia. <i>J. T. Tweddell</i>	664
Syphilis of the Placenta. <i>P. J. Kearns</i>	625	The Relation of Bronchiectasis to Paranasal Sinus Infection. <i>G. E. Hodge</i>	666
Pentothal: a New Intravenous Anæsthetic. <i>K. M. Heard</i>	628	Subcutaneous Emphysema Complicating Tonsillectomy. <i>L. J. Baker</i>	670
Cryptomyces Pleomorpha has no Etiological Relation to Carcinoma. <i>P. Beregoff-Gillow</i>	634	Cancer: an Effective Offensive. <i>E. E. Shepley</i>	672
Effects of Betaine Upon the Cholesterol and Bilirubin Contents of Blood Plasma in Diabetes Mellitus. <i>I. M. Rabinowitch</i>	637		
The Unstable Colon. <i>C. J. Tidmarsh</i>	641	CLINICAL CONFERENCES	
		Recurrent Pulmonary Œdema with Cerebral Lesion. <i>L. F. Barker</i>	676

CONTINUED ON PAGE IV

POMMADE MIDY SUPPOSITOIRES MIDY

HEMORRHOIDS

4

ACTIVE
PRINCIPLES

MIDY

EPINEPHRIN

STOVAIN

ANESTHESIN

STABILIZED EXTRACT
OF FRESH HORSE CHESTNUT

MIDY'S PIPERAZINE LABORATORIES, New Birks Bldg. MONTREAL

LABORATOIRES MIDY: 67 Avenue de Wagram, Paris 17e. J. EDDE Limited, Montreal, General Agent for CANADA

NOVAR

SEZOBENZOL

BILLON

REMAINS
UNSURPASSED
FOR THE
**INTENSIVE
TREATMENT
OF
SYPHILIS**

INTRAVENOUS
INJECTIONS

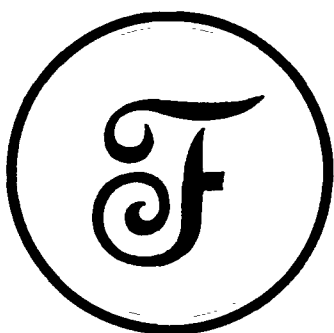
LABORATORY POULENC FRÈRES
of Canada Limited

Dalvi

Canadian Distributors: ROUGIER FRÈRES, 350 LeMoyne St., MONTREAL.

CONTENTS CONTINUED FROM PAGE II

	Page		Page
CASE REPORTS		MEDICAL SOCIETIES	
A Case of Meningitis Due to <i>B. Proteus</i> , with Recovery. <i>J. C. Calloun</i>	679	Calgary	705
A Case of Rupture of the Spleen. <i>J. R. Mulloy</i>	680	Montreal Physiological.	705
EDITORIALS		Saint John	707
Chronic Poisoning with Carbon Monoxide	681	POST-GRADUATE COURSES	
The Protection of Nurses Against Tuberculosis	682	Children's Memorial Hospital, Montreal	707
EDITORIAL COMMENTS		UNIVERSITY NOTES	
The Health Insurance Bill in British Columbia	683	Pennsylvania	707
The Late William Blair-Bell, M.D., F.R.C.S.	683	Toronto	708
State Medicine	684	SPECIAL CORRESPONDENCE	
Dr. Edward W. Archibald	684	The London Letter.	708
Dr. D. E. Robertson	685	The Edinburgh Letter	709
MEDICAL ECONOMICS		LETTERS, NOTES AND QUERIES	
The Health Insurance Bill of British Columbia	685	Appreciation from the Canadian Red Cross Society	710
A Letter to All Members of the Medical Profession in British Columbia	686	TOPICS OF CURRENT INTEREST	
MEN AND BOOKS		The Use of Iodized Salt in Canada	711
The Tendon of Achilles. <i>J. H. Couch</i>	688	Medicodentally Speaking!	711
ASSOCIATION NOTES		ABSTRACTS FROM CURRENT LITERATURE	
The Annual Meeting:		Medicine	712
A Message from the President-elect	689	Surgery	714
Victoria: This Year's Convention City	689	Obstetrics and Gynaecology	715
Program	694	Physiology and Biochemistry.	715
General Information	697	Pathology and Experimental Medicine	716
A Criticism of the Constitution and By-laws of the Proposed Federation of the Canadian and the Provincial Medical Associations	700	Therapeutics	717
		Hygiene and Public Health.	719
		NEWS ITEMS	
		Great Britain	719
		Canada	720
		General.	722
		Book Reviews	726



imely formulae

ACETOPHEN CO. with CODEINE

C.T. No. 222 "Frosst"

R̄ Acetophen, 3½ gr.
Phenacetin, 2½ gr.
Caffeine citrate, . . . ½ gr.
Codeine phosphate, ⅛ gr.

ACETOPHEN CO. with CODEINE, R̄2

C.T. No. 282 "Frosst"

R̄ Acetophen, 3½ gr.
Phenacetin, 2½ gr.
Caffeine citrate, . . . ½ gr.
Codeine phosphate, ¼ gr.

ACETOPHEN CO. with CODEINE, R̄3

C.T. No. 292 "Frosst"

R̄ Acetophen, 3½ gr.
Phenacetin, 2½ gr.
Caffeine citrate, . . . ½ gr.
Codeine phosphate, ½ gr.

USE, ONE OR TWO TABLETS, AS DIRECTED BY PHYSICIAN

Bottles of 100 and 500 tablets.



Wm. E. Frosst & Co.

Montreal, Canada

The Canadian Medical Association Journal

The Official Organ of the Canadian Medical Association and of all Provincial Medical Associations of Canada

Editorial Office, 3640 University St. - Montreal

CENTRAL EDITORIAL BOARD

Editor, A. G. Nicholls, M.A., M.D., D.Sc., F.R.S.C., F.R.C.P.(C.)

Assistant Editor, H. E. MacDermot, M.D., F.R.C.P.(C.)

Managing Editor, F. S. Patch, M.D.

Maude E. Abbott; E. W. Archibald; A. T. Bazin; F. G. Finley; D. Selater Lewis;

C. F. Martin; J. C. Meakins; L. C. Simard

CORRESPONDING MEMBERS

P. C. Dugneau; N. B. Dreyer; J. G. FitzGerald; J. Miller; Ross Mitchell; Alan Rankin; E. M. Watson.

CHAIRMEN OF PROVINCIAL EDITORIAL BOARDS

ALBERTA—G. E. Learmonth, Calgary.

BRITISH COLUMBIA—D. E. H. Cleveland, Vancouver.

MANITOBA—Ross Mitchell, Winnipeg.

NEW BRUNSWICK—A. S. Kirkland, Saint John.

NOVA SCOTIA—J. S. MacLennan, C. W. Holland.

ONTARIO—J. H. Elliott, Toronto.

P. E. ISLAND—J. A. McPhee, Summerside.

SASKATCHEWAN—Lillian Chase, Regina.

MEMBERSHIP including *Journal*, \$10.00. Subscription to *Journal* is \$6.00 and is limited to Libraries, Hospitals and doctors residing outside Canada. Volume commences with January and July Issues. Index in June and December Issues.

CONTRIBUTIONS

EXCLUSIVE PUBLICATION: Articles are accepted for publication on condition that they are contributed solely to this *Journal*. Arrangements for simultaneous publication may be made under exceptional circumstances.

COPYRIGHT: Matter appearing in the *Journal* is covered by copyright under the Copyright Act of 1921, but, as a general rule, no objection will be made to the reproduction in reputable medical journals of anything in these columns, provided proper credit is given.

MEMORANDUM FOR CONTRIBUTORS

MANUSCRIPTS: Should be typewritten, double-spaced, and the original copy submitted, otherwise they cannot be accepted.

REFERENCES: Should be arranged as follows:

In the case of a Journal: ROBINSON, A. L.: Exophthalmic goitre, *J. Am. M. Ass.*, 1919, 72: 1327. The black face type (72:) stands for the volume. In a typewritten manuscript the volume number should be underlined.

In the case of a book: KLEIN: Micro-organisms of Disease, Macmillan, London, 1st ed., 1896, p. 151.

Bibliographies are tending to become so cumbersome that frequently the *Journal* has to omit them for lack of space. Contributors are asked to give only the most important references.

ILLUSTRATIONS: Will be paid for by us when satisfactory photographs or drawings are supplied by the author. Negatives are not acceptable. Each illustration, table, etc., should bear the author's name on the back. Photographs should be clear and distinct, preferably black and on glazed paper; drawings should be made in india ink on white paper. For illustrations requiring cuts the best copper plate is used and all are printed on glazed paper. The *Journal* reserves the right to limit the number of illustrations. Contributors are respectfully requested to limit illustrations to such as are absolutely necessary.

REPRINTS: These may be ordered by contributors from the printers upon the form submitted with the galley proof.

ADVERTISEMENTS

First advertising forms go to press thirty days in advance of the date of issue. In forwarding copy, time must be allowed for setting up and submitting proof. Advertising rates on request.

N.B.—We endeavour to exclude from our columns all unethical advertisements and appreciate notification from our readers relative to any misrepresentation.

CLASSIFIED ADVERTISEMENTS are payable in advance. To avoid delay in publishing, remit with order. Advertisements under the following headings cost \$2.00 for each insertion of 40 words or less, additional words 5 cents each.

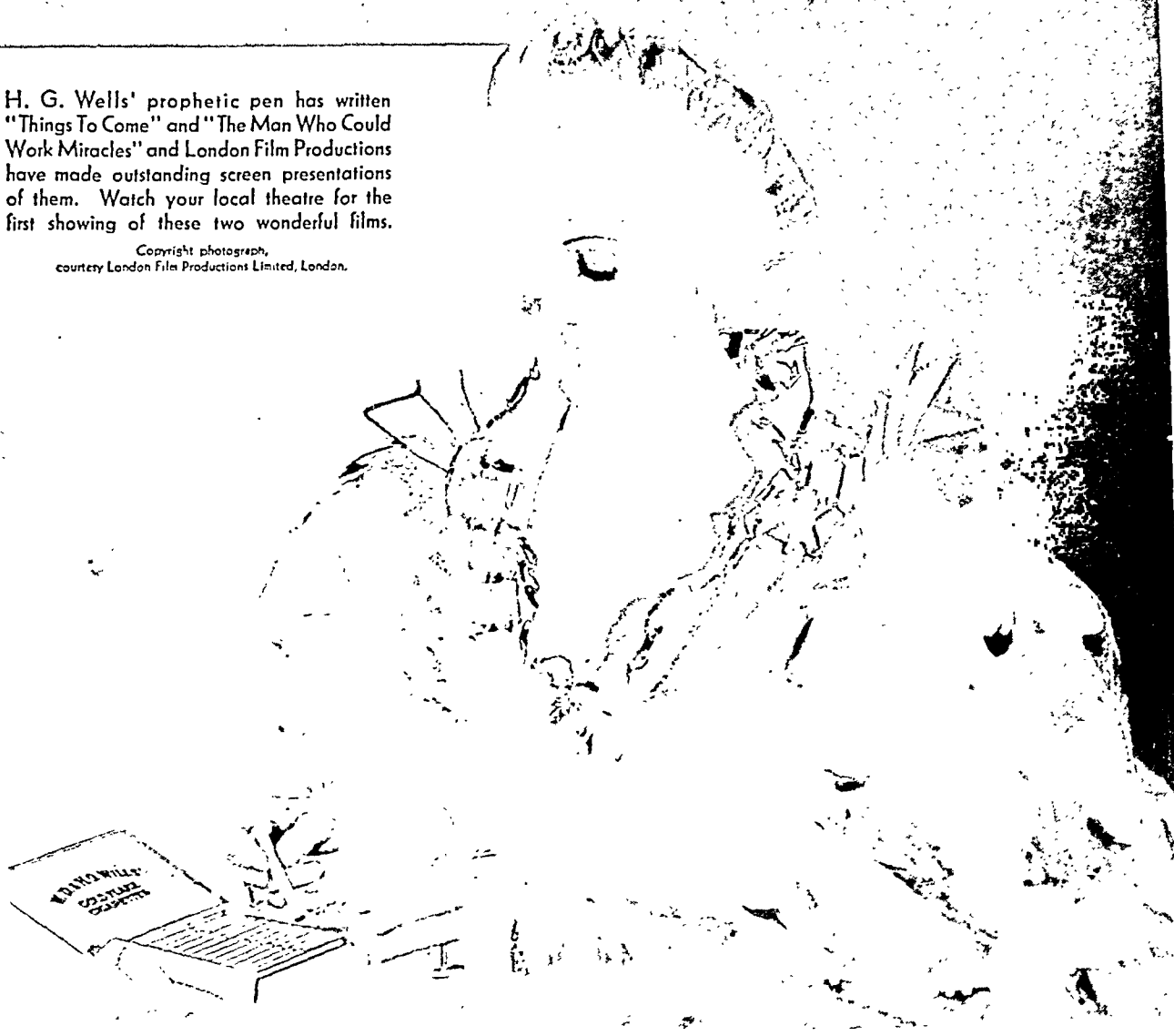
WANTED: Apparatus, Assistant, Books, Location, Partner, Partnership, Situation.

FOR SALE: Apparatus, Practice, Sanitaria, Drug Stores.

THE SMOKE OF THE BRITISH EMPIRE

H. G. Wells' prophetic pen has written "Things To Come" and "The Man Who Could Work Miracles" and London Film Productions have made outstanding screen presentations of them. Watch your local theatre for the first showing of these two wonderful films.

Copyright photograph,
courtesy London Film Productions Limited, London.



Sophie Stewart—you remember her charming role in "Marigold"—is dressed here as she appears with Roland Young in "The Man Who Could Work Miracles" by H. G. Wells. This film and "Things To Come," in which Miss Stewart plays a leading role opposite Raymond Massey, the brilliant Canadian-born actor, are Mr. Wells' initial efforts as a screen writer. The whole world is eagerly awaiting their showing.

One fine day in 1883 a man bought the first package of W. D. & H. O. Wills' Gold Flakes. In the fifty-three years that have since passed, the preference for Gold Flakes has swept the world. Miss Stewart's photograph proclaims her preference, too.

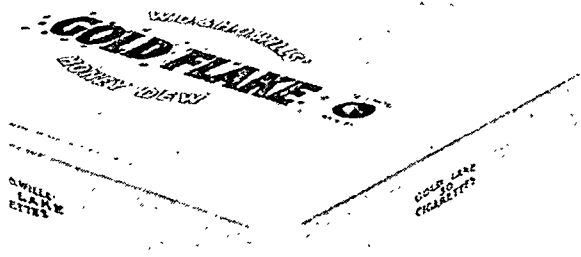
W. D. & H. O. WILLS'

GOLD FLAKE

CORK TIP OR PLAIN
CIGARETTES

A shilling in London—a quarter here

*Pocket tin
of fifty—
55 cents*



The Canadian Medical Association

Affiliated with the British Medical Association

President—J. C. MEAKINS, Montreal.

President-Elect—H. M. ROBERTSON, Victoria.

Chairman of Council—G. S. YOUNG, Toronto.

Honorary Treasurer—F. S. PATCH

Editor—A. G. NICHOLLS

3640 University Street, Montreal.

General Secretary—T. C. ROUTLEY, 184 College Street, Toronto.

Associate Secretary—G. HARVEY AGNEW, Toronto.

THE GENERAL COUNCIL

G. S. YOUNG, Toronto, *Chairman*

J. D. Adamson, Winnipeg	John Fraser, Montreal	C. F. Martin, Montreal	F. S. Patch, Montreal
G. A. B. Addy, Saint John	W. E. Gallie, Toronto	J. C. Meakins, Montreal	R. K. Paterson, Ottawa
G. Harvey Agnew, Toronto	J. H. Geddes, London	H. H. Milburn, Vancouver	W. S. Peters, Brandon
W. E. Ainley, Vancouver	Léon Gérin-Lajoie, Montreal	D. P. Miller, Prince Albert	G. R. Peterson, Saskatoon
E. B. Alport, Regina	A. L. Gerow, Fredericton	B. R. Mooney, Edmonton	A. Primrose, Toronto
A. W. Argue, Grenfell	A. T. Gillespie, Fort William	J. C. Morrison, New Waterford	G. S. Purvis, New Westminster
B. C. Armstrong, Medicine Hat	J. C. Gillie, Fort William	E. W. Montgomery, Winnipeg	
F. M. Auld, Nelson	Duncan Graham, Toronto	E. S. Moorhead, Winnipeg	W. N. Rehfuess, Bridgewater
J. M. Barry, Saint John	J. V. Graham, Halifax	W. L. Muir, Halifax	C. G. Reinhorn, Bellevue
A. T. Bazin, Montreal	H. G. Grant, Halifax	A. R. Munroe, Edmonton	H. M. Robertson, Victoria
R. M. Benvie, Stellarton	W. E. Gray, Milltown	H. H. Murphy, Victoria	F. W. Routley, Toronto
C. H. Best, Toronto	S. E. Grondin, Quebec	H. E. MacDermot, Montreal	T. C. Routley, Toronto
J. E. Bloomer, Moose Jaw	John Gunn, Winnipeg	J. H. MacDermot, Vancouver	E. S. Ryerson, Toronto
Wesley Bourne, Montreal	W. Hackney, Calgary	Alexander E. MacDonald, Toronto	D. A. Stewart, Ninette
Wm. Boyd, Winnipeg	E. R. Hall, Vancouver	J. J. McDonald, New Glasgow	J. C. Simpson, Summerside
I. A. Brokenshire, Windsor	B. J. M. Harrison, Vancouver	J. S. McEachern, Calgary	H. B. Small, Ottawa
Alan Brown, Toronto	J. J. Heagerty, Ottawa	F. G. McGuinness, Winnipeg	W. Harvey Smith, Winnipeg
W. G. M. Byers, Montreal	V. E. Henderson, Toronto	R. E. McKechnie, Vancouver	Howard Spohn, Vancouver
G. Stewart Cameron, Peterboro	S. R. D. Hewitt, Saint John	S. H. McKee, Montreal	Jas. Stevenson, Quebec
F. T. Campbell, Calgary	C. P. Howard, Montreal	F. D. McKenty, Winnipeg	G. F. Strong, Vancouver
L. L. Charpentier, Drummondville	A. W. Hunter, Vancouver	J. W. McKenzie, Charlottetown	M. W. Thomas, Vancouver
H. H. Chown, Winnipeg	O. M. Irwin, Swift Current	K. A. MacKenzie, Halifax	P. H. T. Thorlakson, Winnipeg
D. E. H. Cleveland, Vancouver	A. B. Jackson, Simcoe	Murray MacLaren, Saint John	E. E. Trottier, Montreal
W. K. Colbeck, Welland	F. W. Jackson, Winnipeg	J. C. McMillan, Winnipeg	C. J. Veniot, Bathurst
W. J. Cook, Sudbury	Geo. R. Johnson, Calgary	W. J. P. MacMillan, Charlottetown	G. C. VanWart, Fredericton
P. C. Dagneau, Quebec	J. H. Jones, Vancouver	D. S. Maenab, Calgary	H. C. Wales, Toronto
W. A. Dakin, Regina	W. A. Jones, Kingston	W. J. McNally, Montreal	Ward Woolner, Ayr
W. H. Delancy, Quebec	A. S. Kirkland, Saint John	J. F. McNeill, Summerside	Norman Wrong, Toronto
H. A. Dixon, Toronto	W. J. Knox, Kelowna	T. McPherson, Victoria	C. F. Wyld, Montreal
R. W. L. Earle, Perth, N.B.	T. M. Leask, Moose Jaw	J. D. McQueen, Winnipeg	
Gordon S. Fahrni, Winnipeg	Forrest Leeder, Victoria	A. G. Nicholls, Montreal	H. M. Yelland, Peterboro
J. G. FitzGerald, Toronto	Albert LeSage, Montreal	J. R. Nugent, Saint John	I. J. Yeo, Charlottetown
J. T. Fotheringham, Toronto	David Low, Regina	L. J. O'Brien, Grande Prairie	A. MacG. Young, Saskatoon
W. W. Francis, Montreal	D. C. Malcolm, Saint John		H. E. Young, Victoria
Allan Fraser, Victoria			

EXECUTIVE COUNCIL

George S. Young, Toronto	J. G. FitzGerald, Toronto	J. S. McEachern, Calgary	A. G. Nicholls, Montreal
<i>Chairman</i>	Léon Gérin-Lajoie, Montreal	K. A. McKenzie, Halifax	F. S. Patch, Montreal
A. T. Bazin, Montreal	Duncan Graham, Toronto	J. C. Meakins, Montreal	A. Primrose, Toronto
J. E. Bloomer, Moose Jaw, Sask.	A. S. Kirkland, Saint John, N.B.	E. S. Moorhead, Winnipeg	H. M. Robertson, Victoria, B.C.
			T. C. Routley, Toronto

For names of Sectional Officers, Standing Committees, and Officers of Provincial Medical Associations see alternate issues.

For Control of Pain and Cough—

Dipaudia
dihydromorphinone hydrochloride

COUNCIL
ACCEPTED

A powerful analgesic with several advantages over morphine. Acts quicker and causes fewer undesirable side-effects. A dose of 1/20 grain will generally take the place of 1/4 grain morphine. Dose: for pain 1/32 to 1/16 grain; for cough, 1/96 to 1/24 grain.

Literature upon request from

MERCK & CO. Ltd., 412 St. Sulpice St., MONTREAL - Selling Agents

Manufacturers: Bilhuber-Knoll Corp., Jersey City, N.J.

ARMITE

(REGISTERED TRADE MARK)

r its VITAMIN B CONTENT

The routine provision of Vitamins B₁ and B₂ in the form of Marmite is being increasingly recommended in preventive and curative medicine.

Medical officers in charge of maternity and child welfare centres report that systematic Marmite therapy is of special value for the maintenance of the health of their patients.

r its ANTI-ANAEMIC PROPERTIES

In certain forms of anaemia—particularly in anaemias showing a macrocytic hyperchromic blood picture—the regular administration of Marmite forms an essential part of the treatment.

For sample and literature write

THE MARMITE FOOD EXTRACT CO., LTD.

Walsingham House, Seething Lane, London, E.C. 3.

or to

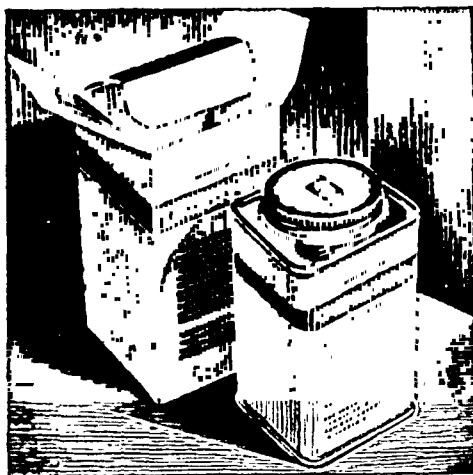
MacLAREN-WRIGHT, LTD.

69 Front Street East, Toronto

Canadian Distributors

Packed in jars—2 oz., 4 oz., 8 oz. and 7 lb. tins.

Special quotations for supplies in bulk to Hospitals and Institutions.



Gastric Hyperacidity

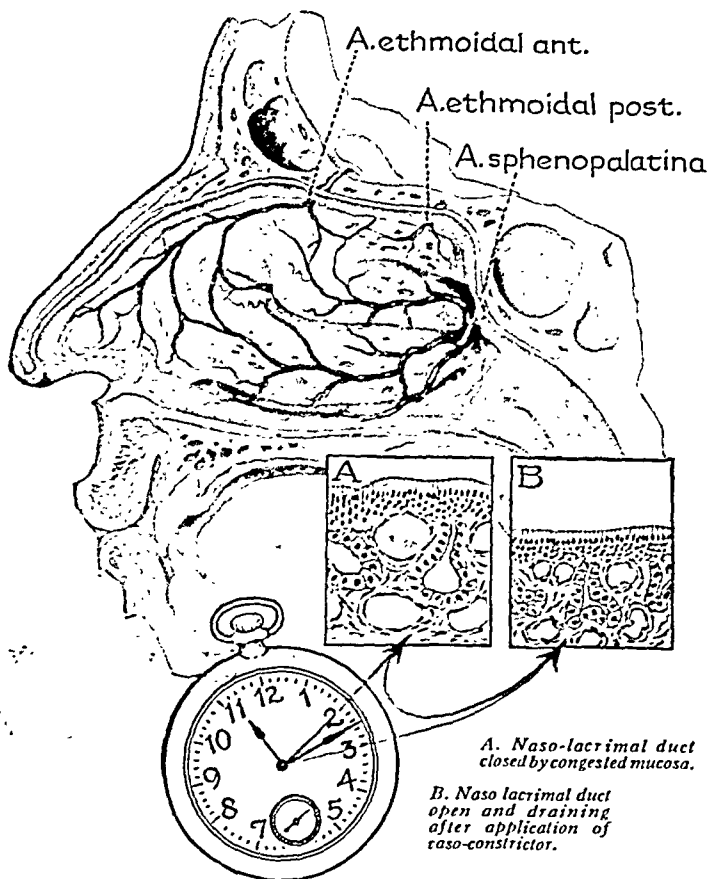
In the relief of gastric hyperacidity, *speed* is essential—Cal-Bis-Ma provides it. The neutralizing effect should be *prolonged* so as to prevent secondary acid rise—again Cal-Bis-Ma takes care of that. The irritated gastric mucosa should be soothed and protected from further irritation—that, too, is an important mission of Cal-Bis-Ma. Send for a trial supply and descriptive literature.

CAL-BIS-MA

WILLIAM R. WARNER & CO., LTD.
727 KING STREET, WEST · TORONTO, ONTARIO

Cal-Bis-Ma (powder) is supplied in tins (with removable label)
containing 1¾ and 4 ounces.

*In the
'Common Cold',
Coryza,
Sinusitis,
Rhinitis.*



(Levo-meta-methylaminoethanolphenol hydrochloride)

The quick-acting, long-sustained, vaso-constrictive effect of Neo-Synephrin hydrochloride brings much desired comfort and relief—promotes freer breathing.

Other advantages include:

More sustained action than epinephrine
Less toxic in therapeutic doses than epinephrine or ephedrine
No sting at point of application
Little nervousness or palpitation
Active on repeated application

DOSAGE FORMS

SOLUTION
¼% and 1%
(One-Ounce Bottles)

EMULSION
¼%
(One-Ounce Bottles)

JELLY
½% — In Collapsible Tubes
with nasal applicator

Sample and literature on request

FREDERICK STEARNS & COMPANY OF CANADA, LIMITED
WINDSOR, ONTARIO

Detroit, Mich.

San Francisco, Calif.

New York, N. Y.

Kansas City, Mo.

Sydney, Australia



LIKE many another inventive genius Watt did not foresee the future development and numerous ramifications of his discovery.

Similarly, the chemist who originated the first barbiturate could not anticipate that his work would become the basis for the discovery of Luminal, an effective antiepileptic agent. Moreover, Luminal and Luminal Sodium proved excellent sedatives and antispasmodics in a variety of functional and organic disorders.

The prestige which Luminal and Luminal Sodium have gained in therapeutics is due to the fact that physicians are convinced of their potency, their unvarying chemical purity, and rich clinical background.

LUMINAL

Trademark Reg. U. S. Pat. Off. & Canada
Brand of PHENOBARBITAL

WINTHROP CHEMICAL COMPANY, INC.

Pharmaceuticals of merit for the physician

907 ELLIOTT STREET WEST - WINDSOR, ONT.

Factories: Rensselaer, N. Y. - Windsor, Ont.



B. D. H.

Sex Hormone Preparations

●

NAN

The gonadotropic substance from the urine of pregnancy standardised in terms of its power to produce corpora lutea or corpora hæmorrhagica in the ovaries of immature rodents. Indicated in the treatment of hypogonadal states of male or female.

STROFORM

A standardised preparation of the ovarian follicular hormone. Indicated in all cases of deficient ovarian secretion.

TROFORM 'B' An ester of the ovarian hormone for use in cases in which intensive and prolonged therapeutic effect is desired.

GESTIN

The hormone of the corpus luteum standardised for its proliferational activity in the immature rabbit uterus previously treated with œstrin. Indicated in the treatment of habitual abortion and other manifestations of luteal insufficiency.

●

Stocks are held by leading druggists throughout the Dominion, and full particulars are available from

E BRITISH DRUG HOUSES (CANADA) LTD.

1 Warehouse

Toronto 2, Ont.



DOUCHING THAT Soothes

The soothing douche provides relief and comfort to the patient. In the treatment it becomes an efficient aid against irritation, tenesmus and odor. It can be made to serve effectively as a stimulant or relaxing agent; for hyperemia or decongestion . . . Lorate makes an ideal soothing douche solution, bland and non-caustic in its contact with the skin or mucosa. It contains sodium perborate, sodium bicarbonate, sodium chloride, menthol and aromatics. Two teaspoonfuls of Lorate to the quart of water is the usual dosage. Samples on request. Waterbury Chemical Co. of Canada, Ltd., 727 King St., W., Toronto.

LORATE... The Therapeutic Vaginal Douche Powder

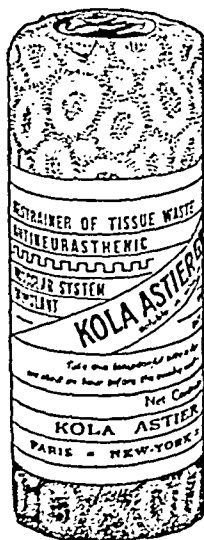
ffective and Dependable

General Stimulation

without

After-Depression

OLA ASTIER
GRANULATED



Restrainers of Tissue Waste
Anti-Neurasthenic
Heart Regulator
Muscular System Stimulant

for

Cardiac Adynamia
Neurasthenia
Post Influenzal Asthenia
Post-Operative Shock
Senile Involution
Mental and Physical Overstrain
Convalescence

A large percentage of the cases treated by the general practitioner are of an asthenic type and call for the use of some supportive and stimulant treatment.

In all materia medica there is no drug that is better adapted to such a class of cases as Kola—the seed, or nut, of the *Sterculia Acuminata*.

The stimulation of Kola is peculiar in that it is tonic in effect and that, unlike that of ordinary stimulants, it is never followed by after-depression. Its co-operating tonic action maintains its beneficial stimulation.

In KOLA ASTIER GRANULATED, the physician has available to him in convenient form a skilfully prepared standardized extract, containing all the active principles of the Kola Nut: *Caffeine*, *Caffeine-Catechin*, *Theobromine*, *Kola-Red* and *Tannin*. Kola Astier is not habit forming.

Send for Literature and Sample

Agents for Ontario, the Western and Maritime
Provinces:

N A. HUSTON COMPANY, LTD.
36-48 Caledonia Road - Toronto

Agents for the Province of Quebec:

ROUGIER FRÈRES
350 LeMoyné Street - Montreal

Presenting A New Iron Therapy

FERROUS SULPHATE
WITH
MEDICINAL YEAST
IN TWO COMBINATIONS

PLASTULES (Deshell) PLAIN

PLASTULES (Deshell) WITH LIVER

PLASTULES (Deshell) are soluble elastic capsules made by an entirely new method in which the *ferrous sulphate, yeast and liver* are suspended in a soft, semi-fluid state permitting rapid absorption and assimilation. Plastules (Deshell) are made in two types for the physician's convenience in treating various anemic conditions.

THE TWO TYPES

Plastules (Deshell) Plain

Each Plastule contains:—

- 5 grains ferrous sulphate (exs.) potentiated with
- Vitamins B₁ and B₂ as contained in a specially concentrated medicinal yeast.

Indicated in all iron deficiency anemias.

Dose

One capsule after meals.

Cost

Boxes of 75 capsules on prescription, \$1.00.

Plastules (Deshell) with Liver

Each Plastule contains:—

- 2½ grains ferrous sulphate potentiated with
- Vitamins B₁ and B₂.
- Liver Extract concentrate.
- Indicated for use in all anemias where a combination of iron and the anti-anemic liver fraction are desired.

Dose

Two capsules three times a day after meals.

Cost

Boxes of 50 capsules on prescription, \$1.50.

*Address all inquiries for further information
on Deshell Plastules to*

DESHELL LIMITED

364 Argyle Road

WALKERVILLE, ONTARIO

PLASTULES (DESHELL) PLAIN

FERROUS SULPHATE and VITAMINS B1 and B2

EFFECTIVE DAILY DOSE


— IS 3 CAPSULES



THIS IS
EQUIVALENT
TO

90 GRAINS
IRON & AMONIUM
CITRATE —

60 GRAINS BLAUD



"15 grains of ferrous sulphate per day as contained in three plain Plastules (Deshell) is just as much a 'massive' dose of iron judged by clinical efficiency as 60-90 grains Bland or 90-120 grains of iron and ammonium citrate".

SYNERGY

IN THE TREATMENT OF

ANEMIAS

ABBOTT'S

The ever-increasing knowledge of anemia and its treatment indicates that iron and copper therapy is most effective, especially when administered in standardized proportions of 1 part copper to 25 parts iron.

This form of treatment has been proved to be superior in many ways to the use of excessive doses of iron alone. The ingestion of large amounts of iron may interfere seriously with the assimilation of phosphorus and lead to rickets. In cases of simple nutritional anemia, the dosage of iron must remain at a low level if one is to expect continued beneficial results from iron therapy.

Abbott's Copron Elixir is an agreeably-tasting tonic of whole liver extract with iron and copper in the proportions of 1 to 25 as given above. The liver extract, in addition to furnishing the factor essential to the production of mature red blood corpuscles, possesses remarkable qualities valuable in the treatment of anemias of the secondary type. The iron, with the copper as a metabolic activator will replenish hemoglobin. Abbott's Copron Elixir is supplied in 12 and 80 oz. bottles. Samples and literature will be sent on request. ABBOTT LABORATORIES LIMITED, 388 St. Paul St. West, Montreal.

COPRON ELIXIR

The Canadian Medical Association Journal



Editor

A. G. NICHOLLS, M.A., M.D., D.Sc., F.R.S.C., F.R.C.P.(C.)

Published by

THE CANADIAN MEDICAL ASSOCIATION

1936

INDEX TO VOLUME 34

The following contractions are used in regard to the indexed material: (C)—Correspondence; (E)—Editorial; (Ret)—Retrospect; (Ab)—Abstracts; (Ob)—Obituary.

A

- ABBOTT, A. C. AND PRENDERGAST, J.: Histology of thyroid gland in pregnancy 609.
 ABBOTT, M. E.: History of embryology; review 82.
 Abductors, laryngeal, of influenzal origin, bilateral paralysis of; case, J. N. Roy 427.
 Accidents, traffic, arrangements in certain provinces for compensation for care of 94.
 Achilles, tendon of, J. H. Couch 688.
 Acidi lactici, bacillus, infection of sternum; case, G. D. Little 185.
 Adrenalin, pituitary spasm removed by, G. G. Copeland 317.
 Advertising, radio, reform in (Ab) 217.
 AGNEW, G. H.: Canadian hospital taken over by Canadian hospital council 555.
 Alarm reaction, H. Selye 706.
 Alberta, amendments to various acts in 476, 596.
 ALLISON, DUNCAN (Ob) 593.
 Anæmia, iron preparations in treatment of, J. T. Tweddell 664.
 — pernicious, with uric acid deposits in kidneys; with case, H. B. Burchell 540.
 — primary aplastic, E. B. Astwood 501.
 Anæsthetic, making ether an ideal, W. N. Kemp 409.
 — new intravenous; pentothal, K. M. Heard 628.
 Anæsthetics, local, cocaine, novocaine and allied drugs, prolonged toxic effects of; untoward effects of nembutal, F. H. Wetmore 299.
 Anatomy, rôle of, in radiological study of spine, W. A. Jones 265.
 ANDERSON, H. B.: Criticism of constitution and by-laws of proposed federation of Canadian and provincial medical associations 700.
 Aneurysm of aorta, with rupture into mediastinum and partial dissection of left parietal pleura; with case, S. R. Townsend 542.
 Annual meetings, presentation of papers at (E) 553.
 Ano-rectum in chronic constipation, E. A. Daniels 169.
 Anti-influenza bacillus serum, influenzal meningitis treated with, G. E. White 163.
 Antirachitic effect of irradiated fresh milk, T. G. H. Drake, F. F. Tisdall and A. Brown 279.
 Aorta, aneurysm of, with rupture into mediastinum and partial dissection of left parietal pleura; with case, S. R. Townsend 542.
 Aplastic anæmia, primary, E. B. Astwood 501.
 Appendicitis, mesenteric lymphadenitis in adolescents simulating, D. C. Collins 402.
 Archibald, Edward, Trudeau medal awarded (E) 684.
 ARMSTRONG, G. W.: Acute septic arthritis 177.
 Arsenical poisoning, medico-legal aspect of (E) 435.
 Arsphenamine dermatitis, experimental, F. E. Cormia 272.
 Arteries, coronary, problems connected with disease of (E) 190.
 Arthritis, acute septic, G. W. Armstrong 177.
 — study of (E) 194.
 Association notes. See page 10.
 ASTWOOD, E. B.: Primary aplastic anæmia 501.
 — — See Howlett, J. G.
 Atlas of congenital cardiac disease, prepared by Maude E. Abbott (E) 194.
 Atmospheric pollen in Montreal, H. E. MacDermot and G. R. Howell 316.
 Auditory nerve, intracranial division of vestibular portion of, for Ménière's disease, K. G. McKenzie 369.

- Auricular fibrillation, strophanthin in treatment of, H. E. Rykert and J. Hepburn 281.
 Avertin; analysis of 1600 administrations, F. Shipway 2.

B

- BABKIN, B. P.: I. P. Pavlov (E) 438.
 Bacillus acidi lactici infection of sternum; case, G. D. Little 185.
 — proteus, meningitis due to, with recovery; case, J. C. Calhoun 679.
 Balancing and hearing, milestones in development of our knowledge of (Ret) W. J. McNally 195.
 BALTZAN, D. M.: Hepato-cerebral syndrome; case 544.
 BAKER, L. J.: Tonsillectomy complicated by subcutaneous emphysema 670.
 BANTING, F. G.: See Hall, G. E.
 BARAGAR, CHARLES ARTHUR (Ob) 593.
 BARKER, L. F.: Recurrent pulmonary œdema with cerebral lesion 676.
 BARONSFEATHER, C. G. S.: Can these things be: plea for physical culture (C) 585.
 BAYNE, CHARLES (Ob) 593.
 BEDARD, AZARIE EUGENE (Ob) 356.
 BELL, T. HERBERT (Ob) 111.
 BELT, T. H., IRWIN, D. AND KING, E. J.: Silicon and dust deposits in tissues of persons without occupational exposure to siliceous dusts 125.
 BEREGOFF-GILLOW, P.: Cryptomyces pleomorpha has no etiological relation to carcinoma 634.
 — — Importance of early diagnosis in mycotic diseases with special reference to blastomycosis 152.
 BERGERON, JOSEPH EUSÈBE (Ob) 356.
 BESNER, J. EDOUARD (Ob) 111.
 BEST, C. H.: See Kerr, R. B.
 Betaine, effects of, upon cholesterol and bilirubin contents of blood plasma in diabetes mellitus, I. M. Rabinowitch 637.
 Bibliographies (E) 193.
 Bilateral paralysis of laryngeal abductors of influenzal origin; case, J. N. Roy 427.
 Bile pigment metabolism and excretion in icterus neonatorum, S. G. Ross, H. T. Malloy and T. R. Waugh 705.
 Bilirubin and cholesterol content of blood plasma, effects of betaine upon, in diabetes mellitus, I. M. Rabinowitch 637.
 BIRT, A. R.: See Davidson, A. M.
 Bitterling test for pregnancy, R. Gottlieb 431.
 BLACKADAR, ROSS LIVINGSTON (Ob) 474.
 Bladder, carcinoma of, choice of treatment in, R. Pearse 308.
 BLAIR, E. M.: Induction of labour by rupture of membranes 49.
 BLAIR-BELL, WILLIAM (Ob) 683.
 Blastomycosis, importance of early diagnosis in mycotic diseases with special reference to, P. Beregoff-Gillow 152.
 Blood-diluting pipettes, simple device for drying, M. C. Dinberg 432.
 — lipids in polycythæmia vera, E. M. Boyd 51.
 — plasma, effects of betaine upon, in diabetes mellitus, I. M. Rabinowitch 637.
 — bilirubin contents of, in diabetes mellitus, I. M. Rabinowitch 637.
 — transfusion, transmission of, T. Cadham 428.
 — transfusions, are they worth while?

- Bone defect of ulna treated by bone graft; case, N. W. Roome 64.
 — Hodgkin's disease of, M. C. Morrison 393.
 Book reviews. *See* page 10.
 Bowel, large, endometriosis of, N. J. Maclean 253.
 BOWIE, D. J.: Distribution of peptic and mucous cells in gastric mucosa 707.
 BOWMAN, R. O., PITTS, H. C., MITCHELL, P. H. AND EWERTZ, E.: Calcium and protein studies in malignant disease 527.
 BOYD, E. M.: Blood lipids in polycythæmia vera 532.
 — — Post-anæsthetic leucocytosis 159.
 BRIDGES, M. A.: Physician and modern dietetics 659.
 British Columbia, health insurance in 116, 232, 476.
 — — — — bill in 685. (E) 683. *See also* Medical Economics.
 — — tuberculosis control in 209.
 — — medical association meeting at Melbourne 91.
 — — — world tour, personal impressions of, R. D. Rudolf 326.
 Bronchiectasis, relation of, to paranasal sinus infection, G. E. Hodge 666.
 BROWN, A.: *See* Drake, T. G. H.
 BROWN, CAROLINE SOPHIA (Ob) 356.
 BROWN, R. J.: Increased incidence of peptic ulcers among single unemployed 306.
 BROWN, T. E.: Fracture of femur occurring at delivery; case 65.
 Buck, Anson, M.D., M.R.C.S., 1833-1919, S. H. Corrigan 564.
 BURCHELL, H. B.: Pernicious anæmia with uric deposits in kidneys; with case 540.
 BURGESS, J. F.: Chronic glanders 258.
 Butler, Samuel, centenary of, H. E. MacDermot 443.
- C
- CADHAM, F. T.: Transmission of malaria by blood transfusion; case 428.
 Cæsarean section, J. H. Couch and H. N. Couch 201.
 Calcification of gallbladder; case, F. B. Gurd 187.
 Calcium and protein studies in malignant disease, R. O. Bowman, H. C. Pitts, P. H. Mitchell and E. Ewertz 527.
 CALHOUN, J. C.: Meningitis due to bacillus proteus with recovery; case 679.
 CAMERON, D. E.: Training in psychiatry 78.
 CAMPBELL, D. G.: Visceral behaviour in neuroses 422.
 CAMPBELL, W. R.: Obesity and its treatment 41.
 — — *See* Kerr, R. B.
 Can these things be: plea for physical culture (E) 192. (C) 585.
 Canada and South Africa, entozoa of man in, H. B. Fantham and A. Porter 414.
 — use of iodized salt in (Ab) 711.
 Canadian Eskimos in eastern Arctic, clinical and other observations on, I. M. Rabinowitch 487.
 — hospital taken over by Canadian hospital council (E) 555.
 — legislation of medical interest passed during 1935; summary (Ab) 462.
 — medical association, history of, 1867-1921; review, W. B. Howell 330. (E) 74.
 — and provincial medical associations, criticism of constitution and by-laws of proposed federation of 700.
 — Red Cross society, appreciation from (C) 710.
 — rheumatic disease association (E) 554, 578.
 Cancer: an effective offensive, E. E. Shepley 672.
 Carbon monoxide, chronic poisoning with (E) 681.
 Carcinoma of bladder, choice of treatment in, R. Pearse 308.
 — cryptomyces pleomorpha has no etiological relation to, P. Beregoff-Gillow 634.
 — primary cortical, of suprarenal; case, N. S. Shennstone and G. W. Loughheed 188.
 — — of jejunum, J. E. Plunkett, M. P. Foley and A. M. Snell 289.
 Cardiac disease, congenital. Dr. Maude Abbott's atlas of (E) 194.
 Cardiovascular-renal disease, is it increasing as cause of death in Canada, M. T. Macklin 56.
 Carpal scaphoid, fractures of, D. W. G. Murray 180.
 Cataract and dinitrophenol (E) 71.
 Caudate nucleus, further observations on stimulation of, F. R. Miller 96.
 CAULFEILD, A. H. W.: Tulip fingers; ragweed dermatitis 506.
 Cerebral lesion, recurrent pulmonary œdema with, L. F. Barker 676.
 CHILDE, A. E.: *See* Klein, D. L.
 Children, normal, hæmoglobin of, and factors influencing its formation, J. R. Ross and P. Summerfeldt 155.
 — — — — rheumatic infection in; symposium 581.
 — — — — schizoid trends in, C. A. Cleland 514.
 Children's memorial hospital, Montreal, post-graduate course in 707.
 CHIPMAN, W. W.: Maternal mortality (E) 552.
 CHISHOLM, DUNCAN MACINTOSH (Ob) 356.
 Cholesterol and bilirubin contents of blood plasma, effects of betaine upon, in diabetes mellitus, I. M. Rabinowitch 637.
 — — — — crystals, so-called mosaic fungus as intercellular deposit of, A. M. Davidson and P. H. Gregory 277.
 CLARK, ADÉLARD (Ob) 593.
 CLELAND, C. A.: Schizoid trends in children 514.
 CLEVELAND, D. E. H.: Shakespeare a medical prophet (C) 215.
 Climate, relation of, to tuberculosis (E) 436.
 CLOUTIER, NORBERT (Ob) 593.
 Clubbing, congenital familial, of fingers and toes, F. L. Horsfall 145.
 Cocaine, novocaine and allied drugs; prolonged toxic effects of local anæsthetics; untoward effects of nembutal, F. H. Wetmore 299.
 Cœlia disease, F. Shippam 243.
 COLBORNE, HENRY WENDALL AMBROSE (Ob) 356.
 COLLINS, D. C.: Mesenteric lymphadenitis in adolescents simulating appendicitis 402.
 COLLINS, R. J. AND MACMILLAN, C. W.: Tuberculosis and student nurse 649.
 COLLIP, J. B. AND WILLIAMSON, J. E.: Modification of effect of pituitary gonadotropic hormone by varying modes of injection 458.
 — — — — *See* Selye, H.
 Colon, unstable, C. J. Tidmarsh 641.
 COMMINS, MATTHEW EDWARD (Ob) 593.
 Compensation in certain provinces for care of traffic accidents 94.
 CONE, W. AND PENFIELD, W.: Subtemporal and suboccipital myoplastic craniotomy 16.
 Congenital cardiac disease, Dr. Maude Abbott's atlas of (E) 194.
 — — — — malformed first dorsal rib; case, C. K. P. Henry 545.
 CONNOR, EMMA (Ob) 594.
 Constipation, chronic, ano-rectum in, E. A. Daniels 169.
 Constitution and by-laws applicable to divisions 332, 449.
 — — — — of proposed federation of Canadian and provincial medical associations, criticism of 700.
 COPELAND, G. G.: Pituitary spasm removed by adrenalin 317.
 CORMIA, F. E.: Experimental arsphenamine dermatitis 272.
 Coronary arteries, problems connected with disease of (E) 190.
 — — — — disease, certain forms of treatment of (E) 550.
 — — — — clinical features of (E) 319.
 — — — — diagnosis of (E) 423.
 — — — — occlusion, recent experimental work on (E) 69.
 — — — — thrombosis and myocardial failure, experimental production of, G. E. Hall, G. H. Ettinger and F. G. Banting 9.
 CORRIGAN, S. H.: Anson Buck, M.D., M.R.C.S., 1833-1919 564.
 Cosmetics, drugs, therapeutic devices and food, legislation pending in congress concerning (Ab) 345.
 CÔTÉ, J. ALBERT (Ob) 594.

- COUCH, J. H.: Tendon of Achilles 688.
 — and COUCH, H. N.: Cesarean section 201.
 Craniotomy, subtemporal and suboccipital myoplastic, W. Cone and W. Penfield 16.
 Cryptomyces pleomorpha has no etiological relation to carcinoma, P. Beregoff-Gillow 634.
 Crystals, cholesterol, so-called mosaic fungus as intercellular deposit of, A. M. Davidson and P. H. Gregory 277.
 CUNNINGHAM, JOHN DONALD (Ob) 111.
 Curriculum, medical, reform of, in Great Britain (C) 709.
 CUTHBERTSON, CHARLES ROBERT (Ob) 228.
- D
- Dafoe, Allan Roy (E) 73.
 DAFOE, A. R.: Further history of care and feeding of Dionne quintuplets 26.
 Damages, husband's right of action for (Davy v. Morrison) (Ab) 346.
 DANIELS, E. A.: Ano-rectum in chronic constipation 169.
 DAVIDSON, A. M. AND BIRT, A. R.: Treatment of congenital syphilis with stovarsol 33.
 — — — GREGORY, P. H.: So-called mosaic fungus as intercellular deposit of cholesterol crystals 277.
 DAY, J. G. (Ob) 228.
 Deaths, maternal, R. E. Wodehouse 525.
 Dermatitis, chronic radiation, surgical treatment of, S. Gordon 622.
 — experimental arsphenamine, F. E. Cormia 272.
 — ragweed; tulip fingers, A. H. W. Caulfeild 506.
 Diabetes mellitus, effects of betaine upon cholesterol and bilirubin contents of blood plasma in, I. M. Rabinowitch 637.
 DIAMOND, H.: See Secord, E. R.
 Dietetics, modern, and the physician, M. A. Bridges 659.
 DINBERG, M. C.: Simple device for drying blood diluting pipettes 432.
 Dinitrophenol and cataract (E) 71.
 Dionne quintuplets, further history of care and feeding of, A. R. Dafoe 26.
 Dorsal rib, first, congenital malformed; case, C. K. P. Henry 545.
 DOWD, ROBERT STEWART (Ob) 111.
 DRAKE, T. G. H., TISDALL, F. F. and BROWN, A.: Further observations on antirachitic effect of irradiated fresh milk 279.
 Drugs, cosmetics, therapeutic devices and food, legislation pending in congress concerning (Ab) 345.
 DUNCAN, A. H.: Sedimentation test in pulmonary tuberculosis 655.
 DUNLOP, FREDERICK THOMAS (Ob) 594.
 Dust and silicon deposits in tissues of persons without occupational exposure to silicious dusts, T. H. Belt, D. Irwin and E. J. King 125.
- E
- Edinburgh letter (C) 99, 213, 341, 461, 583, 709.
 Editorials. See page 11.
 ELLIOTT, J. H.: Regulations in Ontario for control of tuberculosis among nurses in sanatoria and public hospitals (E) 323.
 Embolism, fat, R. I. Harris, 166.
 Embryological and clinical aspect of double ureter, A. B. Hawthorne 21.
 Embryology, history of; review, M. E. Abbott 82.
 Emergencies, surgical, in general practice exclusive of trauma, R. R. Graham 36.
 Emphysema, subcutaneous, tonsillectomy complicated by, L. J. Baker 670.
 Endocrinology, clinical (Ab) 217.
 Endometriosis of large bowel, N. J. Maclean 253.
 Entozoa of man in Canada and South Africa, H. B. Fantham and A. Porter 414.
 Epidemic diseases in Ethiopia (Ab) 101.
 Epithelial cells in submaxillary gland, factors controlling secretory activity of different types of, H. E. Rawlinson 459.
 Eskimos, Canadian, in eastern Arctic, clinical and other observations on, I. M. Rabinowitch 457.
 Ether, an ideal anæsthetic, W. N. Kemp 409.
 Ethics of medical practice, D. A. Stewart 325, 442.
 Ethiopia, epidemic diseases in (Ab) 101.
 ETTINGER, G. H.: See Hall, G. E.
 Euthanasia, voluntary 112. (C) 100.
 EVANS, GRIFFITH (Ob) 111.
 EWERTZ, E.: See Bowman, R. O.
- F
- Facial integument and extremities, hypertrophy of palpebræ and, with osteoperiostosis, J. N. Roy 615.
 FANTHAM, H. B. and PORTER, A.: Entozoa of man as seen in Canada and South Africa 414.
 Fat embolism, R. I. Harris 166.
 Federation of Canadian and provincial medical associations 208, 331. (C) 214.
 — proposed, of Canadian and provincial medical associations, criticism of constitution and by-laws of 700.
 Fees, physician's, method of determining (Hebert v. Deslandes) (Ab) 103.
 — — — (Wood v. McMartin) (Ab) 103.
 Femur, fracture of, occurring at delivery; case, T. E. Brown 65.
 Fingers and toes, congenital familial clubbing of, F. L. Horsfall 145.
 FLEMING, G.: Dominion participation in public health (E) 322.
 — — Givers of life 197.
 — — Report of department of health of Montreal (E) 324.
 FLETCHER, A. A.: See Kerr, R. B.
 FOLEY, M. P.: See Plunkett, J. E.
 FORBES, ALBERT ERNEST (Ob) 594.
 FORBES, ALEXANDER A. (Ob) 228.
 Foreign body trapped by multiple strictures of œsophagus; case, J. G. Strachan 313.
 FORTÉ, L.: See Frappier, A.
 Fracture of femur occurring at delivery; case, T. E. Brown 65.
 Fractures of carpal scaphoid, D. W. G. Murray 180.
 FRAPPIER, A. and FORTÉ, L.: Bacteriological study of new surgical mask "jel" 547.
 FROST, ROBERT SAMUEL (Ob) 358.
 Fungus, mosaic so-called, as intercellular deposit of cholesterol crystals, A. M. Davidson and P. H. Gregory 277.
- G
- GADBOIS, J. ANTHIME (Ob) 474, 594.
 GAGNON, OSWALD ADHÉMAR (Ob) 594.
 Gallbladder, calcification of; case, F. B. Gurd 187.
 — mortality in surgery of, W. O. Stevenson 534.
 Gastric juice, canine, protein and non-protein nitrogen in, S. A. Komarov 459.
 — mucosa, distribution of peptic and mucous cells in, D. J. Bowie 707.
 — ulcers, recent advances in experimental production of, H. Selye, R. L. Stehle and J. B. Collip 339.
 General practice, surgical emergencies in, exclusive of trauma, R. R. Graham 36.
 George the Fifth, King, death of (E) 318.
 Givers of life, G. Fleming 197.
 Gland, submaxillary, factors controlling secretory activity of different types of epithelial cells of, H. E. Rawlinson 459.
 — thyroid, histology of, in pregnancy, A. C. A. and J. Prendergast 609.
 Glanders, chronic, J. F. Burgess 25.
 GLIDDEN, RUFERT WILLIAM (Ob) 111.
 GOLDMAN, S. E.: See Liebman, C.

N

- NEFF, JOHN ALEXANDER (Ob) 112.
 Nembutal, untoward effects of; prolonged toxic effects of local anesthetics; cocaine, novocaine and allied drugs, F. H. Wetmore 299.
 Nerve, auditory, intracranial division of vestibular portion of, for Ménière's disease, K. G. McKenzie 369.
 NESS, WILLIAM (Ob) 595.
 Neuritis, optic, and papillædema (Ret) L. Paton 555.
 Neuroses, visceral behaviour in, D. G. Campbell 422.
 Neurosyphilis, J. C. Hossack and S. C. Patterson 284.
 News. See page 11.
 NICHOL, DAVID HARVEY (Ob) 360.
 NICHOLLS, A. G.: Allan Roy Daffoe (E) 73.
 — — Can these things be; plea for physical culture (E) 192.
 — — Canadian rheumatic disease association (E) 554.
 — — Certain forms of treatment in coronary disease (E) 550.
 — — Chronic poisoning with carbon monoxide (E) 681.
 — — Clinical features of coronary disease (E) 319.
 — — Diagnosis of coronary disease (E) 433.
 — — Dinitrophenol and cataract (E) 71.
 — — Escape of Dr. D. E. Robertson from Moose River mine (E) 685.
 — — Experimental work on coronary occlusion (E) 69.
 — — Medical periodical literature (E) 73.
 — — Our medico-legal department (E) 437.
 — — Presentation of papers at annual meetings (E) 553.
 — — Problems connected with disease of coronary arteries (E) 190.
 — — Trudeau medal awarded Dr. Edward Archibald (E) 684.
 — — William Blair-Bell (Ob) 683.
 NICHOLLS, J. V. V.: Trachoma (Ret) 75.
 Nitrogen, protein and non-protein, in canine gastric juice, S. A. Komarov 458.
 Noise and health (Ab) 101.
 Nose, tip of, completely sectioned; sutured three hours after accident, J. N. Roy 263.
 Nova Scotia, health department of; report for 1935, 598.
 NOVINGER, JEFFERSON TILDEN (Ob) 360.
 Novocaine, cocaine, and allied drugs; prolonged toxic effects of local anesthetics; untoward effects of nembutal, F. H. Wetmore 299.
 Nurse, student, and tuberculosis, R. J. Collins and C. W. MacMillan 649.
 Nurses, protection of, against tuberculosis (E) 682.
 — in sanatoria and public hospitals, regulations in Ontario for control of tuberculosis among (E) 323.

O

- Obesity and its treatment, W. R. Campbell 41.
 Obstetrics in rural Saskatchewan, I. Stewart 439.
 Oedema, recurrent pulmonary, with cerebral lesion, L. F. Barker 676.
 Oesophagus, extreme diffuse dilatation of; case, W. O. Stevenson 311.
 Oesophagus, foreign body trapped by multiple strictures of; case, J. G. Strachan 313.
 Oil, wheat germ (vitamin E), clinical experiences with, E. M. Watson 134.
 Ontario, regulations in, for control of tuberculosis among nurses in sanatoria and public hospitals (E) 323.
 Optic neuritis and papillædema (Ret) L. Paton 555.
 O'SHAUGHNESSY, L. J. (Ob) 230.
 Osteoperiostosis, hypertrophy of palpebræ, facial integument and extremities with, J. N. Roy 615.
 Oxycephaly in brother and sister, D. L. Klein and A. E. Childe 397.

P

- Palpebræ, hypertrophy of, facial integument and extremities with osteoperiostosis, J. N. Roy 615.
 Papers, presentation of, at annual meetings (E) 553.
 Papillædema and optic neuritis (Ret) L. Paton 555.
 Paralysis, bilateral, of laryngeal abductors of influenzal origin; case, J. N. Roy 427.
 Paranasal sinus infection, relation of bronchiectasis to, G. E. Hodge 666.
 PARK, THEODORE JAMES (Ob) 230.
 PARK, WILLIAM FREDERICK (Ob) 230.
 Patents, medical (Ab) 102.
 PATON, L.: Papillædema and optic neuritis (Ret) 555.
 PAYLOV, I. P. (Ob) 438.
 PEARSE, R.: Choice of treatment in carcinoma of bladder 308.
 PENFIELD, W.: See Cone, W.
 Pentothal; new intravenous anæsthetic, K. M. Heard 628.
 PEPPERS, HUGH WILEY (Ob) 595.
 Peptic and mucous cells in gastric mucosa, distribution of, D. J. Bowie 707.
 — ulcers, increased incidence of, among single unemployed, R. J. Brown 306.
 Periodical literature, medical (E) 73.
 Pernicious anæmia. See Anæmia.
 Perspiration, excessive, A. H. Pirie 301.
 PETERSON, S. C.: See Hossack, J. C.
 Phenol, practical uses of (C) 344.
 — therapeutic value of (C) 98.
 Physical culture, plea for; can these things be (E) 192. (C) 585.
 Physician and modern dietetics, M. A. Bridges 659.
 Physician's fees, method of determining (Hebert v. Deslandes) (Ab) 103.
 — — — (Wood v. McMartin) (Ab) 103.
 Pipettes, blood-diluting, simple device for drying, M. C. Dinberg 432.
 PIRIE, A. H.: Excessive perspiration 301.
 PITTS, H. C.: See Bowman, R. O.
 Pituitary gonadotropic hormone, modification of effect of, by varying modes of injection, J. B. Collip and J. E. Williamson 458.
 — spasm removed by adrenalin, G. G. Copeland 317.
 Placenta, syphilis of, P. J. Kearns 625.
 PLUNKETT, J. E., FOLEY, M. P. and SNELL, A. M.: Primary carcinoma of jejunum 289.
 Pneumonia, lobar, artificial pneumothorax in; 10 cases, J. G. Howlett, R. Luff and E. B. Astwood 387.
 Poisoning, arsenical, medico-legal aspect of (E) 435.
 — chronic, with carbon monoxide (E) 681.
 Pollen, atmospheric, in Montreal, H. E. MacDermot and G. R. Howell 316.
 Polycythæmia vera, blood lipids in, E. M. Boyd 532.
 PORTER, A.: See Fantham, H. B.
 Post-anæsthetic leucoeytosis, E. M. Boyd 159.
 Practice, general, surgical emergencies in, exclusive of trauma, R. R. Graham 36.
 — medical, ethics of, D. A. Stewart 325, 442.
 Pregnancy, Bitterling test for, R. Gottlieb 431.
 — histology of thyroid gland in, A. C. Abbott and J. Prendergast 609.
 PRENDERGAST, J.: See Abbott, A. C.
 Prepyloric lesions, radiological findings in, A. C. Singleton 382.
 Professional secrecy and privileged communications; suit for cancellation of insurance policy (Mutual life insurance company of New York v. Dame Henriette Jeannotte-Lamarche) (Ab) 218.
 Protamine insulin, R. B. Kerr, C. H. Best, W. R. Campbell and A. A. Fletcher 400.
 Protein and calcium studies in malignant disease, R. O. Bowman, H. C. Pitts, P. H. Mitchell and E. Ewertz 527.
 — and non-protein nitrogen in canine gastric juice, S. A. Komarov 458.
 Provincial association notes. See page
 Psychiatry, training in, D. E. Cameron 78.

- Public health, Dominion participation in (E) 322.
 Pulmonary oedema, recurrent, with cerebral lesion, L. F. Barker 676.
 — tuberculosis. *See* Tuberculosis.

Q

- Quintuplets, Dionne, further history of care and feeding of, A. R. Dafoe 26.

R

- RABINOWITCH, I. M.: Clinical and other observations on Canadian Eskimos in eastern Arctic 487.
 — — Effects of betaine upon cholesterol and bilirubin contents of blood plasma in diabetes mellitus 637.
 Radiation dermatitis, chronic, surgical treatment of, S. Gordon 622.
 Radio advertising, reform in (Ab) 217.
 Radiological findings in prepyloric lesions, A. C. Singleton 382.
 — study of spine, rôle of anatomy in, W. A. Jones 265.
 Ragweed dermatitis; tulip fingers, A. H. W. Caulfeild 506.
 RAWLINSON, H. E.: Factors controlling secretory activity of different types of epithelial cells in sub-maxillary gland 459.
 Reaction, alarm, H. Selye 706.
 Red Cross society, Canadian, appreciation from (C) 710.
 REID, WILLIAM (Ob) 595.
 REIST, CLAUDE OWEN (Ob) 360.
 Renal disease, cardiovascular, is it increasing as cause of death in Canada, M. T. Macklin 56.
 — insufficiency, transient, ileus associated with, N. B. Gwyn 412.
 REYNOLDS, MILTON HERBERT (Ob) 595.
 Rheumatic disease association, Canadian (E) 554, 578.
 — infection in children; symposium 581.
 Rhinoscleroma; with case, P. E. Ireland 149.
 Rib, first dorsal; congenital malformed; case, C. K. P. Henry 545.
 Robertson, D. E., escape from Moose River mine (E) 685.
 ROBERTSON, PETER B. (Ob) 360.
 ROOME, N. W.: Bone defect of ulna treated by bone graft; case 64.
 ROSE, WILLIAM OLIVER (Ob) 595.
 ROSS, J. R. and SUMMERFELDT, P.: Hæmoglobin of normal children and factors influencing its formation 155.
 ROSS, S. G., MALLOY, H. T. and WAUGH, T. R.: Bile pigment metabolism and excretion in icterus neonatorum 705.
 ROY, J. N.: Bilateral paralysis of laryngeal abductors of influenzal origin; case 427.
 — — Hypertrophy of palpebræ, facial integument and extremities with osteoperiostosis 615.
 — — Tip of nose completely sectioned; sutured three hours after accident 263.
 Royal college of physicians and surgeons of Canada; fifth annual meeting, Ottawa 94.
 RUDOLF, R. D.: Some personal impressions of British medical association world tour 326.
 Rupture of spleen; case, J. R. Mulloy 680.
 RYAN, E. J. (Ob) 112.
 RYKERT, H. E. and HEPBURN, J.: Strophanthin in treatment of auricular fibrillation 281.

S

- Salivary secretion, physical and physiological studies of, C. O. Hebb, G. O. Langstroth, D. R. McRae and G. W. Stavaky 457.
 Salt, iodized, use of, in Canada (Ab) 711.
 Saskatchewan, changes in health legislation in 600.
 — rural, obstetrics in, I. Stewart 439.
 Scaphoid, carpal, fractures of, D. W. G. Murray 180.
 Schizoid trends in children, C. A. Cleland 514.
 Schools, unapproved medical, interns from 209.
 Sciatica and lumbago, S. A. Wallace 174.

- Scotland, vital statistics for, for 1935 (C) 461.
 SECOND, E. R., MOSS, J. H. and DIAMOND, H.: Modified technique for reproduction of x-ray films 315.
 Secrecy, professional, and privileged communications; suit for cancellation of insurance policy (Mutual life insurance company of New York v. Dame Henriette Jeannotte-Lamarche) (Ab) 218.
 Sedans, snow (Ab) 246.
 Sedimentation test in pulmonary tuberculosis, A. H. Duncan 655.
 SELYE, H.: Alarm reaction 706.
 — — STEHLE, R. L. and COLLIP, J. B.: Recent advances in experimental production of gastric ulcers 339.
 SEMPLE, JAMES (Ob) 596.
 Septic arthritis, acute, G. W. Armstrong 177.
 Sex hormones and their value as therapeutic agents, M. C. Watson 293.
 Shakespeare a medical prophet (C) 215.
 SHENSTONE, N. S. and LOUGHEED, G. W.: Primary cortical carcinoma of suprarenal; case 188.
 SHEPLEY, E. E.: Cancer: an effective offensive 672.
 SHIPPAM, F.: Celiac disease 243.
 SHIPWAY, F.: Avertin: analysis of 1600 administrations 2.
 Short wave therapy, observations on, R. B. Taylor 183.
 Silicon and dust deposits in the tissues of persons without occupational exposure to siliceous dusts, T. H. Belt, D. Irwin and E. J. King 125.
 SINGLETON, A. C.: Radiological findings in pre-pyloric lesions 382.
 Sinus infection, paranasal, relation of bronchiectasis to, G. E. Hodge 666.
 SMITH, MONTAGUE ALBERT BLOWERS (Ob) 230.
 SNELL, A. M.: *See* Plunkett, J. E.
 Snow-sedans (Ab) 246.
 SOMERVILLE, GEORGE W. (Ob) 360.
 South Africa and Canada, entozoa of man in, H. B. Fantham and A. Porter 414.
 Spine, rôle of anatomy in radiological study of, W. A. Jones 265.
 Spleen, rupture of; case, J. R. Mulloy 680.
 State medicine (E) 684.
 Statistics, vital, for Scotland for 1935 (C) 461.
 STAVRAKY, G. W.: *See* Hebb, C. O.
 STEHLE, R. L.: *See* Selye, H.
 Sternum, bacillus acidi lactici infection of; case, G. D. Little 185.
 STEVENSON, W. O.: Extreme diffuse dilatation of œsophagus; case 311.
 — — Mortality in surgery of gallbladder 534.
 STEWART, D. A.: Ethics of medical practice 325, 442.
 STEWART, I.: Obstetrics in rural Saskatchewan 439.
 Stovarsol, treatment of congenital syphilis with, A. M. Davidson and A. R. Birt 33.
 STRACHAN, J. G.: Foreign body trapped by multiple strictures of œsophagus; case 313.
 Strophanthin in treatment of auricular fibrillation, H. E. Rykert and J. Hepburn 281.
 Student nurse, and tuberculosis, R. J. Collins and C. W. MacMillan 649.
 Submaxillary gland. *See* Gland.
 SUMMERFELDT, P.: *See* Ross, J. R.
 S.U.P. 36: valuable aid in treatment of many acute infections, J. H. Grove 67.
 Suprarenal, primary cortical carcinoma of; case, N. S. Shenstone and G. W. Lougheed 188.
 Surgery in small hospital 337.
 Surgical emergencies in general practice exclusive of trauma, R. R. Graham 36.
 — treatment of chronic radiation dermatitis, S. Gordon 622.
 Syphilis, congenital, treatment of, with stovarsol, A. M. Davidson and A. R. Birt 33.
 — of placenta, P. J. Kearns 625.

The Canadian Medical Association Journal

Vol. 34

TORONTO, JUNE, 1936

No. 6

THE HISTOLOGY OF THE THYROID GLAND IN PREGNANCY*

By A. CLIFFORD ABBOTT, B.A., M.D., C.M., F.R.C.S. (EDIN.), F.R.C.S. (C.),

Lecturer in Surgery, University of Manitoba,

AND JAMES PRENDERGAST, M.D.,

Pathologist, St. Boniface Hospital,

Winnipeg

CHARPENTIER, in his *Cyclopædia of Obstetrics and Gynæcology*, published in 1887, states: "Goitre in pregnancy is usually benign and should be treated by general measures and internal treatment. Forbid the patient to nurse, and give iodine." Lawson Tait was the first to describe the step-like enlargement of the thyroid gland associated with multiple pregnancies. Von Groff reported 38.5 per cent of thyroid glands enlarged in pregnant women. Davis¹ makes the sweeping statement that thyroid hypertrophy in women either starts as a congenital defect or begins at puberty or during pregnancy. He also states that moderate hypertrophy of the thyroid gland has been accepted as an incident of pregnancy.

An extensive review of the literature reveals no unanimity of opinion as to what happens to the thyroid gland during pregnancy. Most opinions are based upon surmise or theoretical grounds and not upon the actual study of the thyroid gland during pregnancy and careful comparison of their findings with an equal number of what are known to be normal glands.

Roughly, one can divide current beliefs into three schools: (1) that the thyroid gland becomes hyperplastic during pregnancy; (2) that the thyroid gland becomes hypoplastic or colloid in nature during pregnancy; (3) that there is no change in the histology of the thyroid

gland. Generally speaking, American observers favour the hyperplastic theory, while Continental workers believe that there is either no change or that the gland becomes colloid in nature.

THE HYPERPLASTIC THEORY

Marine² states there is always some decrease in the iodine content of the thyroid gland during pregnancy, and urges the giving of iodine to prevent the hypertrophy that occurs so commonly. He does not state, however, what histological changes in the thyroid gland accompany this hypertrophy. Schwarz³ in discussing Davis' paper, stated that he had studied a series of thyroid glands from guinea pigs, removed at various stages of pregnancy. The histological changes were striking. About the end of the first third of gestation there was a marked hyperplasia of the interfollicular tissue with slightly increased storage of colloid. At the middle of gestation the hyperplasia of the interfollicular tissue was even more marked and colloid storage still more increased. During the time that corresponds to between 50 and 55 days of gestation the acini were markedly distended with colloid and the interfollicular tissue was compressed and thinned out. At term, however, the colloid had markedly decreased and the interfollicular tissue had become more prominent, but much less so than in mid-pregnancy. He believed that this thyroid activity might be helpful in speeding up glycogenolysis during this period in order that the fetus might more readily obtain the carbohydrate which it needs so abundantly for the storage of glycogen and fat at this time.

Falls⁴ believes that many of the nervous symptoms in pregnancy are due to abnormal activity of the thyroid gland induced by the pregnant state, but offers no proof for his statement. Verdozzi⁵ studied the thyroid gland of 20 guinea pigs in different stages of pregnancy, seven after parturition and three unmated. In the first half of pregnancy the gland showed marked activity evidenced by hyperæmia of the tissues and the acini were lined by cuboidal epithelium and full of colloid. In the second half of pregnancy there was no definite hyperæmia, the epithelium was lower, interfollicular islands were scarce,

* From the Departments of Surgery and Pathology, St. Boniface Hospital.

and the colloid was hyaline and reduced in amount. Bokelmann and Scheringer⁶ found that the blood iodine is already relatively high in the second and third months of pregnancy and keeps rising until the seventh month. Here it remains stationary until the ninth month, when it begins to fall. These investigators also found that by injecting sublethal doses of thyrotropic hormone derived from the anterior lobe of the hypophysis they produced the same changes in the thyroid as occur during pregnancy. In describing these they state that there was a marked increase in the amount of colloid, which completely filled the acini and even intruded into the inter-acinar spaces. The acini were medium in size or large, and were lined by a single layer of cubical or low columnar cells.

Schettchenhelm and Eisler found that injection of adrenalin into a patient with Graves' disease (a disease in which the blood iodine is also high as in pregnancy) caused a marked fall in the iodine concentration of the blood. They found that this also occurred in pregnant women, but that in myxœdematous or normal women there was a marked rise in blood iodine. Scheringer⁷ repeated these experiments. He injected 0.005 mg. of adrenalin into each of seven pregnant women between the fifth and eighth month, after previously estimating the amount of blood iodine. He collected samples of blood at 30 seconds, 30 minutes, 1 hour, and 24 hours. He found that there was a marked fall in blood iodine concentration at 30 seconds, and after this that it gradually rose, until at the end of 24 hours it was back to about its normal level. He therefore argued that in pregnancy and Graves' disease the thyroid was in a state of hyperactivity because in both conditions he found a high blood iodine which fell rapidly after the administration of adrenalin.

THE HYPOTHYROID THEORY

On the other hand such authorities as Breitner⁸ believe all pregnant women are hypothyroid. Knaus⁹ states that the changes in the thyroid gland in pregnancy are to be ascribed to hypofunction. He points out that this is indicated by the increase in granular colloid containing a low iodine content, a decrease in the excretion of water and sodium chloride, nitrogen retention, a decrease in the resorptive capacity of the subcutaneous tissues, and a decrease in the function of the ovaries. This assumption of hypofunction of the thyroid gland is supported by the favourable influence of thyroid preparations on the œdema of pregnancy. Krjlow and Sternberg¹⁰ showed that immediately following coitus in rabbits there was an increase in weight and vascularity of the thyroid, associated with a marked decrease in colloid in the acini. If pregnancy occurred there was a gradual increase in the colloid content of the acini, but not so fast as if pregnancy did not occur. Kraus¹¹ reports three cases of women dying during pregnancy in whom the histological picture of the thyroid was that of hypothyroidism.

Knaus¹² believes that the thyroid loses its function as an organ of internal secretion during pregnancy and that there is a hyperfunction of the hypophysis. Experimentally, he injected virginal rats for two to four weeks with extract of corpus luteum. On post-mortem examination he found the sex organs enlarged and hyperæmic and the thyroid much heavier. Histologically, there was a marked increase in colloid. From this he also concluded that the corpus luteum causes inhibition of the output of thyroid secretion. The animals gained in weight, which also points to hypothyroidism. Ludolf¹³ found that following complete thyroidectomy 10 animals conceived, went through pregnancy normally, and nursed their young. He therefore concluded that the thyroid enlargement which is often noticed in women during pregnancy did not signify any special hyperactivity. Clute and Daniels¹⁴ found pregnancy and hyperthyroidism associated in 0.41 per cent in 3,678 cases, and hence concluded that pregnancy did not appear to be a cause of

hyperthyroidism. Mussey, Plummer and Boothby¹⁵ found hyperthyroidism and pregnancy associated in only 0.6 per cent in 7,228 cases and were of the same opinion as Clute and Daniels. Yoakum¹⁶ added further strength to their argument by finding no case of hyperthyroidism in 937 obstetrical cases. Friedmann,¹⁷ after considerable experimental work and a review of the literature, concluded that, at least in the lower animals, thyroid activity was not necessary in pregnancy.

The fact that the basal metabolism rate rises possibly 30 per cent in the last three months of pregnancy does not prove any increased thyroid activity, but is due merely to the increased protoplasmic mass, chiefly the fetus itself. This has been admirably shown by Sandiford and Wheeler,¹⁸ Root and Root,¹⁹ and Garipuy *et al.*²⁰ Boothby, Wheeler and Sandford²¹ have recently confirmed this on a woman previously studied. In their work they find that although the total calories per hour increase to approximately 25 per cent above the normal level toward the end of pregnancy, yet if this figure is divided by the sum of the surface areas of the fetus and the mother there is no appreciable change in the rate of heat production of a unit mass of tissue during pregnancy.

PERSONAL RESEARCH

After reviewing the literature, we began our study of the effect of pregnancy on the histology of the thyroid gland with perfectly open minds. At the very beginning it was obvious that the normal physiological change in the thyroid gland had to be established in this area. This was carried out on approximately 1,000 animals, ranging from youth to old age.^{22, 23} While it had previously been shown²⁴ that in premature and newborn babies the histology of the thyroid gland varied greatly, it was found that heretofore the wide range of physiological variations had not been appreciated and that the histology of the thyroid varied tremendously with age. Hence any research on the histology of the thyroid gland during pregnancy had to be carried out on animals of about the same age. In this particular research problem it was decided to use cows about 2 years old. Through the courtesy of the Harris Abattoir a series of thyroid glands were collected in individual cans containing 10 per cent formalin from 95 non-pregnant and 103 pregnant cows. The veterinary surgeon present estimated the duration of pregnancy by the development of the fetus. The two series of glands were then blocked, sectioned and stained in exactly the same manner as in all our previous work.^{22 to 25} Each microscopical section was studied in routine fashion, definite information being tabulated as to colloid content, vacuolation, cell-type, tufting, presence of lymphoid tissue, amount of stroma and vascularity. In all these, with the exception of cells, we used the plus and minus system to designate the grade.

Colloid.—As colloid is normally present, we made xx the normal; 0 represented complete absence, and xxxx great distension.

Vacuolation.—In this, too, 0 represented complete absence. When any vacuolation was present it was graded x, xx, and xxx.

Cells.—These were classified finally into three major groups, flat, cubical and columnar. A cubical or low cuboidal cell was considered normal; a flattened cell or columnar cell was considered abnormal.

Tufting.—Tufting was graded x, xx, xxx, xxxx plus, according to the degree present.

Lymphoid tissue.—This was found in so few animals that its presence was merely noted.

Stroma and vessels.—In this case we marked the normals as 0. If less than normal, it was classified -, --, ---, ----, etc., according to the degree of compression. If more than normal, it was classified x, xx, etc., according to the amount of increase.

After a careful study of each section with regard to the above components, we classified them as colloid, normal, or hyperplastic glands. In classifying glands as normal we found a moderately wide range in cell type, stroma, and vascularity which we considered normal. Marine states that any gland in which the cells are higher than low cuboidal is hyperplastic, but our own observations do not support this view. We divided our normals into two types. (1) Normal resting.—These are characterized by low cuboidal epithelium, well-marked colloid distension, and a stroma and vascularity of no great prominence. (2) Normal active.—In these glands the cells are cubical, the colloid content is normal or slightly less than in the normal resting state. The greatest difference is in the interacinar stroma. This was well marked and contained numerous moderately distended vessels, giving the whole gland a very vascular active appearance. These glands appear to be in a transient state, either progressing from a normal resting to a hyperplastic stage, or reverting from a hyperplastic stage to the colloid stage. Whether progressive or regressive, we consider this a normal physiological phase and not pathological. The glands that were considered hyperplastic were classified as 1-2-3-4 plus, according to the type of cell, amount of tufting, and paucity of colloid. On the other hand, those glands that showed flattened epithelium, increased colloid, etc., were graded

1-2-3-4 colloid, according to the degree of change.

We first examined and classified the 95 sections from non-pregnant cows and then having obtained a clear-cut picture of what is actually found in them, we examined the 103 sections from the 103 pregnant animals. Tables I, II and III show our results in tabulated form. In

TABLE I.

	Group A		Group B		Group C	
	Non-Pregnant	Per cent	Pregnant	Per cent	Ordinary	Per cent
Glands examined	95		103		68	
Normal resting..	62	65.3	42	40.0	34	50.0
Normal active...	11	11.6	29	28.1	16	23.4
Colloid glands:						
x.....	6	6.4	6	5.8	8	11.6
xx.....	0		2	1.9	0	
xxx.....	0		0		0	
xxxx.....	0		0		0	
Hyperplastic glands:						
x.....	12	12.6	15	14.5	7	10.2
xx.....	3	3.1	8	7.7	2	2.6
xxx.....	1	1.0	1	0.9	1	1.2
xxxx.....	0		0		0	

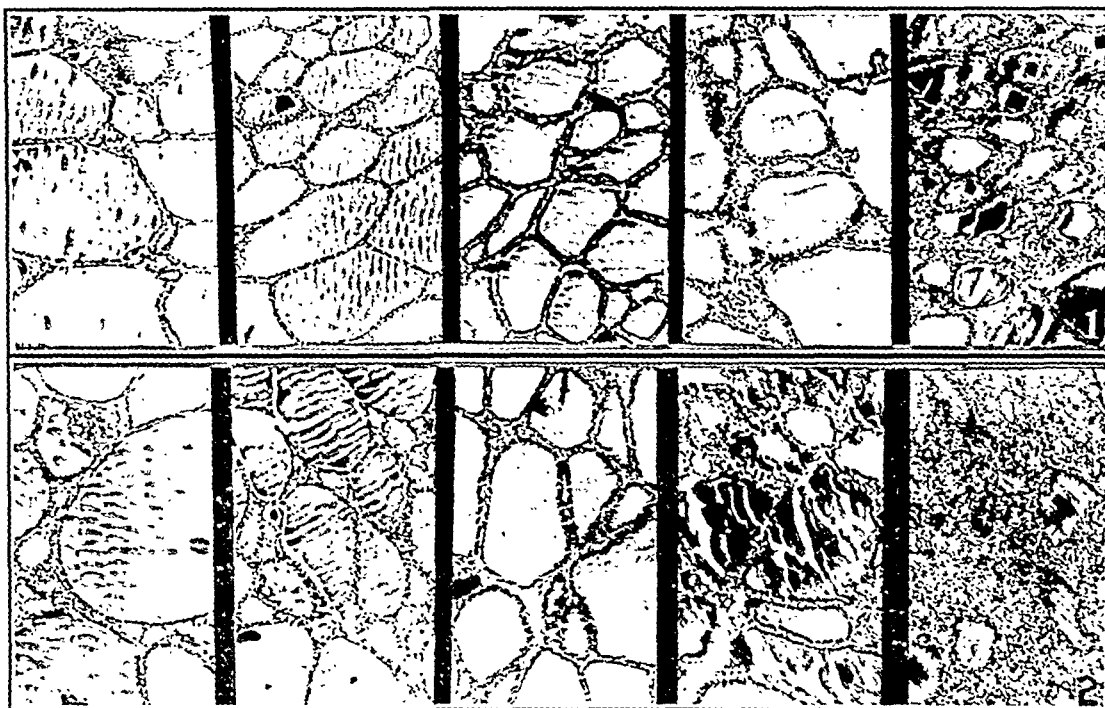
TABLE II.

	Non-Pregnant	Per cent	Pregnant	Per cent
Glands Examined....	95		103	
Amount of colloid:				
0.....	0		0	
1.....	6	6.3	7	6.8
2.....	66	69.4	51	49.5
3.....	23	24.3	36	34.9
4.....	0		9	8.8
Vacuolation:				
0.....	83	87.4	72	69.9
1.....	8	8.4	24	23.3
2.....	4	4.2	6	5.9
3.....	0	0	1	0.9
Cell type:				
Flat.....	5	5.3	12	11.6
Cuboidal.....	71	74.7	70	67.9
Columnar.....	19	20.0	21	20.5
Tufting:				
0.....	87	91.7	82	79.6
1.....	5	5.2	18	17.6
2.....	3	3.1	2	1.9
3.....	0	0	1	0.9
4.....	0	0	0	
Amount Stroma:				
-3.....	0		0	
-2.....	0		3	2.9
-1.....	7	7.4	4	3.8
0.....	44	46.4	32	31.1
+1.....	32	33.6	44	42.8
+2.....	12	12.6	19	18.5
+3.....	0		1	0.9
Vascularity:				
-3.....	0		0	
-2.....	0		1	0.9
-1.....	7	7.4	3	2.9
0.....	57	60.0	41	39.8
+1.....	26	27.3	32	31.1
+2.....	5	5.3	23	22.4
+3.....	0		3	2.9
Lymph tissue:				

Table I we have also included our original figures published before from animals taken, without knowledge as to whether they were pregnant or not.

It will be noted that in all three groups, non-pregnant (A), pregnant (B), and the unknown group (C), the majority of the glands were classified as normal in 76.9 per cent in group A, 68.1 per cent in group B, and 73.4 per cent in group C. However, basing our percentages

two groups of animals. Tables II and III represent in tabloid form the comparative minute histology of the non-pregnant and pregnant group. These Tables are self-explanatory, and there is a marked similarity between both groups, with few exceptions. One or two points are, however, worthy of note. An excessive colloid content in the acini was present in pregnant animals in 43.7 per cent compared with 23 per cent in the non-pregnant. This is a point



on all glands examined, 28.1 per cent of the glands were classified as normal active in group B, against 11.6 and 23.4 in groups A and C respectively. If pregnancy does activate the thyroid gland the number of active glands in group C, in which undoubtedly many pregnant animals were included, should be higher than that in A and lower than the percentage in B, just as was found. In group A 6.4 per cent were classified as colloid goitre, 7.7 per cent in group B, and 11.6 per cent in group C, not coinciding with our previous finding but based upon about eight animals in each group. The remainder were classified as hyperplastic, 16.7 per cent in the non-pregnant group (A), 22.1 per cent in the pregnant group (B), and 14 per cent in group C.

Figs. 1 and 2 represent the histological variations found in non-pregnant animals (A) and in pregnant animals (B). It is quite apparent from a study of these two series of microphotographs that there is no striking difference in the

against hyperplasia. On the other hand vacuolation, a definite sign, in our opinion, of activity, was present in 30.1 per cent of pregnant animals, as against 12.6 in non-pregnant, a point in favour of overactivity. The type cell found was practically identical. Tufting was again another definite evidence of activity higher in the pregnant animals, being present in 20.4 per cent of the group in comparison with 8.3 per cent in the non-pregnant group. In Table II it will be noted that there was an increase in stroma in 61.3 per cent of pregnant animals, in comparison with 44 per cent in non-pregnant animals. This is again in favour of hyperactivity. Vascularity also was increased in the pregnant group as compared with the non-pregnant group, being present in 56.4 per cent and 31 per cent respectively.

We have also endeavoured to trace any change in the thyroid at various periods during pregnancy. Table III shows in tabloid form the histological classifications from one to nine

months. Schwarz³ reported, following an investigation of guinea pigs, definite changes during pregnancy. During the first half of pregnancy he found a gradual increase in the interfollicular tissue together with an increase in colloid. For a short period following this the colloid kept on increasing, but the interfollicular tissue became compressed and thinned out. Toward term there was again an increase in the interfollicular tissue together with a rapid loss

can be drawn. Further work on a larger number of animals must be done on this particular phase of the subject.

DISCUSSION

As we²⁵ have already pointed out, one must give the thyroid gland a much wider range of physiological variation than has heretofore been done. This is the first and greatest basic fact on which we must judge the changes found in the thyroid glands of pregnant animals. The statement by many investigators that the thyroid gland is enlarged in about 30 per cent of pregnant women to our minds is of no clinical value whatever. Two years ago, one of us, in going over the records of 778 university girls from all parts of western Canada, ranging from 14 to 37 years of age, obtained some interesting information. Of 778 girls examined, 480 were classified as normal and 256, or 32.9, had enlarged thyroids, were under treatment or had had their thyroids removed. The work was done to follow up a large survey on children in the public schools in which it was shown that there is a progressive increase in the incidence of enlarged thyroids in girls up to high school age. It is therefore valueless to report the number of thyroid enlargements during pregnancy unless is given at the same time the size of the gland previous to the onset of pregnancy.

The greatest amount of evidence in our research points to a slight increase in activity of the thyroid during pregnancy, purely physiological in character. We base this assertion upon a slight increase in the number of active glands found in pregnant animals in comparison with non-pregnant animals. In addition we found vacuolation more frequent in pregnant animals (30.1 per cent) than in non-pregnant (12.6 per cent), and tufting, stroma, and vascularity were all increased in greater percentages.

Mayo and Plummer state that a supply of iodine inadequate for the proper functioning of the thyroid gland followed by a subnormal delivery of thyroxine to the tissues produces hypothyroidism. Consequently there is an increased thyroid stimulation, causing diffuse hypertrophy of the thyroid gland; the secretory processes are altered, the diffuse hypertrophy disappears, colloid is stored in excess and diffuse colloid goitre results. Hinton²⁶ and Frazier and Ulrich²⁷ offer this explanation for the thyroid enlargement during pregnancy.

TABLE III.

	1	2	3	4	5	6	7	8	9	Final analysis of preg. animals	Final analysis of non-preg. animals
Colloid											
4....	..	..	..	..	..	..	..	..	..	0	..
3....	..	..	..	..	..	..	..	..	..	0	..
2....	1	..	..	..	1	..	..	..	..	2	..
1....	..	1	1	2	..	1	..	1	..	6	6
0....	..	..	..	..	..	..	..	..	..	0	0
Hyperplastic											
4....	..	..	..	..	..	..	..	..	..	0	0
3....	1	..	..	..	..	..	..	..	..	1	1
2....	..	4	..	..	1	1	1	..	1	8	3
1....	5	4	3	..	3	..	..	..	..	15	12
Normal activity	2	7	1	3	3	6	1	5	1	29	11
Rest...	5	10	14	5	2	2	1	1	2	42	62
	14	26	19	10	10	10	3	7	4		
Colloid	7.2	3.8	5.3	20	10	10		14.3			
Hyperplastic	42.8	30.8	15.6	..	40	10	33.3	..	25		
Normal activity	14.3	26.9	5.3	30	30	60	33.3	71.4	25		
Resting	35.7	38.5	73.8	50	20	20	33.3	14.3	50		

of colloid. Verdozzi⁵ found a marked increased activity in the first half of pregnancy, characterized by marked interacinar hyperæmia and some increase in colloid, associated with cubical epithelium. In the second half of pregnancy the interacinar tissue became less marked, the epithelium lower, and the colloid lessened. Bokelmann and Scheringer⁶ state that during pregnancy there is a marked increase in the amount of colloid associated with cubical or low columnar cells. Krjlow and Sternberg found an increased vascularity with loss of colloid in rabbits following coitus. This was followed by an increase again in colloid—more so if pregnancy did not occur. These statements are so much at variance that no conclusion of any value can be drawn. Certainly from Table III, based upon five times as many animals and well-controlled observations, no definite conclusion

Are they not attributing to pregnancy what is really a simple iodine deficiency?

SUMMARY

1. A review of the literature as to the effects of pregnancy on the thyroid gland leaves one with no definite proof of any pathological change.

2. In our opinion, any statement as to an actual enlargement of the thyroid gland during pregnancy must be accompanied by positive knowledge of the condition of the gland before the onset of pregnancy.

3. We have shown that over 30 per cent of young women in our district have enlarged thyroid glands before pregnancy has taken place. This corresponds very closely to the number reported as being enlarged during pregnancy.

4. One must clearly differentiate between enlargement due to lack of iodine and enlargement due to pregnancy. The basic factor is probably a lack of iodine.

5. Our findings, based upon a series of 103 animals of similar age at various stages of pregnancy carefully compared with 95 non-pregnant animals of similar age, point to mild increased physiological activity.

6. This increased physiological activity is more pronounced in the earlier months of pregnancy.

REFERENCES

1. DAVIS, C. H.: Thyroid hypertrophy and pregnancy, *J. Am. M. Ass.*, 1926, 87: 1004.
2. MARINE, D.: Thyroid in relation to obstetrics and gynaecology, *Surg., Gyn. & Obst.*, 1917, 25: 272.
3. SCHWARZ, O.: (quoted by Davis, *loc. cit.*).

4. FALLS, F. H.: Hyperthyroidism complicating pregnancy, *Am. J. Obst. & Gyn.*, 1929, 17: 536.
5. VERDOZZI, C.: Ricerche is lo fisiologiche sulla ghiandola tiroide in gravidanza e dopo il parto, *Polliclin*, 1931, 38: 375.
6. BOEKLIMANN, O. AND SCHERINGER, W.: Beitrag zur Kenntnis der Schilddrüsenfunktion und des Jodstoffwechsels in der Gestation, *Arch. f. Gynäkol.*, 1931, 143: 512.
7. SCHERINGER, W.: Zur Frage der Hyperfunktion der Schilddrüse in der Gravidität, *Klin. Wochenschr.*, 1933, 12: 107.
8. BREITNER, B.: Personal communication.
9. KNAUS, H.: Zur Schilddrüsenfunktion in der Schwangerschaft, *Zentralbl. f. Gynäkol.*, 1924, 48: 2, 330.
10. KRJLOW, L. N. AND STERNBERG, A. T.: Die Schilddrüsenkolloidveränderung bei Kaninchen unter dem Einflusse des Koitus und der Schwangerschaft, *Endokrinologie*, 1932, 10: 37.
11. KRAUS (quoted by Stewart, J. D. and Menne, F. R.): The relationship of iodine to basal metabolism rate and to the changes in the thyroid gland in pregnant rabbits, *Endocrinology*, 1933, 17: 93.
12. KNAUS, H.: The relation of the thyroid gland to the female genital organs and to pregnancy, *Arch. f. Klin. Chir.*, 1924, 131: 412.
13. LUDOLF, H.: Ueber die Deutung der morphologischen Schilddrüsenveränderungen in der Schwangerschaft, *Arch. f. Gynäkol.*, 1933, 154: 256.
14. CLUTE, H. M. AND DANIELS, D. H.: Hyperthyroidism and pregnancy, *Am. J. M. Sc.*, 1930, 179: 477.
15. MUSSEY, D., PLUMMER, W. A. AND BOOTHBY, W. M.: Pregnancy complicating exophthalmic goitre, *J. Am. M. Ass.*, 1926, 87: 1009.
16. YOAKUM, W. A.: The thyroid gland in pregnancy; clinical study in a region of endemic goitre, *Am. J. Obst. & Gyn.*, 1928, 15: 617.
17. FRIEDMANN, J.: Tierexperimentelle Untersuchungen über Beziehungen zwischen Schwangerschaft und Schilddrüse, *Arch. f. Gynäkol.*, 1933, 153: 48.
18. SANDIFORD, I. AND WHEELER, T.: The basal metabolism before, during, and after pregnancy, *J. Biol. Chem.*, 1924, 62: 329.
19. ROOT, H. K. AND ROOT, H. F.: The basal metabolism during pregnancy and the puerperium, *Arch. Inter. Med.*, 1923, 32: 41.
20. GARIPUY, LASSALLE, H. AND SENDRAIL, M.: Origin of increased metabolism in pregnancy, *Gyn. et Obst.*, Paris, 1926, 13: 161.
21. BOOTHBY, W., WHEELER, T. AND SANDIFORD, I.: Metabolic studies during pregnancy and menstruation, *Proc. Staff Meet. Mayo Clinic*, 1931, 6: 69.
22. ABBOTT, A. C. AND PRENDERGAST, J.: Histological variations in animal thyroids in western Canada, *Canad. M. Ass. J.*, 1934, 31: 465.
23. ABBOTT, A. C., GOODWIN, A. M. AND MELTZER, S.: The effect of tracheal compression on the thyroid gland, *Canad. M. Ass. J.*, 1923, 28: 481.
24. ABBOTT, A. C. AND BALL, R. P.: Pathology of the thyroid gland of the human fetus and the new-born infant, *Canad. M. Ass. J.*, 1931, 24: 347.
25. ABBOTT, A. C.: Simple goitre, *Canad. M. Ass. J.*, 1932, 27: 8; 146; 236; 376.
26. HINTON, J. W.: The significance of thyroid enlargement during pregnancy, *Am. J. Obst. & Gyn.*, 1927, 13: 204.
27. FRAZIER, C. H. AND ULRICH, H. F.: Pathology of the thyroid gland complicating pregnancy, *Am. J. Obst. & Gyn.*, 1932, 24: 870.

THE PRAIRIE DOCTOR.—“Let it not be thought that ‘the Old West’ is wholly gone. So long as hardship, valour and sacrifice remain on these plains, one likes to think that at least a ‘hangover’ of the Old West is with us still. Consider doctors in Saskatchewan rural areas in the late, almost perhaps unprecedented, spell of sub-zero weather—six weeks of it—with the temperature going to 54° below zero in Regina and to more than 60° below in a number of parts of the province. Through all this bitter weather, and, with it, frequently blizzards and badly drifted roads and trails, the country doctor has carried on. Bundled and muffled to the eyes, he has taken to cutter or team, automobile or snowmobile, and with unflinching spirit ridden forth, sometimes in the middle of the night—an ‘awful night’ to be sure—to minister to someone in danger or pain. Sometimes it

has been to bring a new Canadian into the world, sometimes to perform an emergency operation. He has gone to isolated hamlets and to little white houses still standing up bravely in these days on the bald prairie. The ‘country doctor’ still means something in Canada. Here in the West romance and a stout willing heart still invest such a figure. Such a one came back into Ogema, Saskatchewan, the other day after a 52-mile trip in the open. It was a one-day contribution to health and security. The West may be emerging from its pioneering stages, but it is not by any means emerging from the qualities displayed by earlier generations here, nor from the need of continued exercise of those qualities. The rural doctor in the West has been an integral part of the West’s story. His record will be found in the chapters on high courage.”—Editorial from the *Regina Leader-Post*.

HYPERTROPHY OF THE PALPEBRAL TARSUS, THE FACIAL INTEGUMENT AND THE EXTREMITIES OF THE LIMBS ASSOCIATED WITH WIDESPREAD OSTEO-PERIOSTOSIS: A NEW SYNDROME*

By J. N. Roy, M.D., F.A.C.S.,

Professor at the University of Montreal,

Montreal

ABOUT ten years ago a patient consulted me for a condition of the eyelids, which seemed to be a hyaline or amyloid tarsal degeneration. Examination revealed that we had to do rather with a keloid hypertrophy. It was clearly a palpebral condition not previously described. Besides this thickening of the eyelids, the patient had a hypertrophy of the integuments of the face and the extremities of the limbs. And, finally, he suffered from a bony lesion the exterior aspect of which reminded one of acromegaly. However, radiography permitted me to make a diagnosis as well of a generalized osteo-periostosis affecting almost all the bones of the skeleton. This particular condition I shall describe in greater detail in a future communication. I had here to deal with an atypical cutaneous and bony disease, probably caused by the same endocrine trouble responsible for the palpebral hypertrophy.

CASE REPORT

On April 21, 1925, R.L., a male, 37 years of age, consulted me for his eyelids. He said that until 15 years previously his eyes and eyelids had always been in a perfect condition. At that time he was operated on for two chalazions in the upper eyelids. At the age of 20, when occupied in the manufacture of maple syrup in a forest cabin, he had a considerable irritation of the conjunctivæ characterized by marked hyperæmia, itching, epiphora and photophobia. At the beginning of the fall of the same year he noticed that his superior palpebræ, which had always been very supple until then, became stiff. Later, it seemed to him that they were thicker than usual. In process of time the disease increased very slowly, and it was only at the age of 23 years that he observed the same manifestation in the inferior palpebræ. It must be emphasized that these symptoms appeared simultaneously in the case of the upper eye-

lids, and three years later in the lower eyelids. During the subsequent years the palpebral hypertrophy progressed in a symmetrical and hardly perceptible manner. This hypertrophy caused in time a drooping of the superior palpebræ, and the visual field, in consequence, became diminished. However, direct vision always remained good.

On examination I observed a double ptosis covering more than half of the ocular globes. The upper eyelids were very much thickened, especially in the ciliary fields, and particularly in the external canthi. They were rigid, and, in this situation, were no longer in contact with the eyes, which they protected after the manner of a penthouse. In everting them I found that the mucous membrane of the fornix, though congested, did not present any trachomatous lesion. Nevertheless there existed numerous deep fissures, nearly vertical in direction, throughout the tarsus, giving it an irregular appearance, and separating ridges or hard nodules which had the consistence of cartilage. The conjunctiva was quite adherent to all of this hypertrophied tissue. Measurement of the superior palpebræ gave an average of 6.50 cm. in breadth, 3 cm. in height, and 1.25 cm. in thickness up to 1.50 cm. in the mammillated portion of the external canthi, which were not in contact with the eyeball. The lower lids were equally increased in volume, but remained in contact with the eyes. (See Fig. 6, taken in 1925).

From the beginning of his disease the patient complained of a marked permanent conjunctival catarrh, with a slight epiphora. However, the lachrymal ducts were permeable. The skin of the eyelids contained numerous telangiectatic blood vessels, more or less tortuous, producing a violet colour. There was a slight loss of the eyelashes. Refraction showed the patient to be emmetropic, and that his vision was good. The pupils reacted well to light. Perception of colours was normal, as well as the visual field, which was taken after having raised the upper lids as far as possible. Since the fundus of the eye showed no lesion, the corneæ were transparent and sensitive, accommodation was excellent, and there was no diplopia, I concluded that I had to do with an affection which was entirely palpebral. However, the problem proved much more complex than that, because, on continuing the examination, it was evident that my patient suffered from a generalized disease. The size of his head was greater than normal; the skin of his pachydermic face fell into grooves, one cm. in depth; his wrists and ankles were enormous; and the digits of his hands and feet were short and very thick.

As the nasal pyramid was abnormally developed, I practised anterior rhinoscopy. The nostrils were free, and the septum was rectilinear, without thickening. The cartilages not being increased in volume, I had then to do with a hypertrophy of the skin of the nose and of the subcutaneous cellular tissue.

The tongue, the pharynx and the rhinopharynx were normal. From the age of 15, the patient suffered from dental caries, and at the time of examination he had only 22 teeth. Of this number 20 were filled. By transmitted light I observed that the frontal sinuses were particularly large. The conchi of the ears presented

* This *mémoire*, finished in December, 1934, was sent to the "Académie de Médecine de Paris", on January 30, 1935. Upon acknowledgment of its receipt, I addressed to the Secretary, one month later, a letter on this subject. I have read in No. 92 of *La Presse Médicale*, dated November 16, 1935, page 1820, an article by M.M. A. Touraine, G. Solente and L. Golé, entitled: "Un syndrome ostéo-dermopathique: la pachydermie plicaturée avec pachypériostose des extrémités". I declare here that since then I have not changed anything in my text, and that I am publishing my paper as presented to the "Académie de Médecine de Paris".

nothing worthy of note, and the hearing was very good on both sides. The pre-auricular, sub-maxillary and cervical glands, were not enlarged. The thyroid showed no abnormality.

The thorax was well developed and normal. The hairy system throughout the body was absolutely normal, with the exception of a slight madarosis. Of a strong physique and well proportioned, the patient measured five feet, seven inches, and weighed 160 pounds. He had always been very nervous and irritable, and declared spontaneously that he did not like to be annoyed. I asked him a few questions about his hereditary and personal antecedents which, he could not, at this time, sufficiently answer. He permitted no further examination, and went home.

In 1931 I saw him again, and he could then furnish me very interesting information. His maternal grandmother died with a goitre. His mother, as well as three maternal aunts, had hypertrophied thyroid glands. Two of his sisters were also goitrous. The other members of his family showed nothing abnormal in the region of the neck. Also, I learned that in the locality inhabited by his ancestors, and the surrounding places, there had always been many persons affected with goitre. It seems there was no syphilis nor tuberculosis in his ascendants. He was the only one to suffer from his eyes.

No forceps had been used at his birth, although it had been difficult. His weight was nine pounds. It was only at the age of three years that an exaggerated development of the skull and extremities was noticed. This pathological condition increased very slowly. No convulsions occurred during infancy. At the age of 18 the wrinkles of the face began to appear. Towards 22 years, however, the bony hypertrophy ceased, for since 1910 the patient had worn the same size of hat and the same ring on his finger.

I made two biopsies of the sub-conjunctival tarsal tissues of the upper lids, in the region of the external canthi, from the most prominent parts which did not have any contact with the eyeballs. I owe to the courtesy of Prof. Pierre Masson the following anatomico-pathological report.

"The two biopsies present the same aspect; they are two small oblong masses measuring 1 cm. in length by 4 mm. in diameter, formed by a very firm tissue, white and fibrous in appearance. After fixation with Bouin's picric formol, each piece was transversely divided into many portions which were impregnated with paraffin; the others were cut after hardening or treatment with osmic acid. The histological study of these various portions showed lesions exactly similar, both in the right and in the left, but of variable appearance, the description of which is as follows.

"In certain regions we found, especially in the neighbourhood of the palpebral border, Meibomian glands with intact secretory *cils-de-sac*, but with enlarged excretory ducts. At the side, we found small cysts covered by a thick epidermoid epithelium, in which are enclosed masses, or bands of sebaceous cells of spongy structure, other cysts with a purely epidermoid covering, but reduced to one or two layers of flat cells, others finally unprovided with epithelium, and limited only by a fibrous shell. (See Fig. 1).

"All these cavities were filled with an atheromatous mass in which albuminous granulations, neutral fats and some double refractile crystals are mixed together. The intervals between these degenerated glands were composed of a connective tissue in the form of large collagenous bundles between which are found small masses, or discrete, lympho-plasmocytic bands.

"Other cavities filled up with the same atheroma were bordered by a layer formed of giant cells and macrophages, resting on the fibrous shell and taking the place of the old epithelium. In others the giant cells insinuate themselves farther and farther into the central granulo-fatty pulp, and form festoons

around it. Elsewhere, they become more and more numerous, and divide the original atheromatous plate into smaller and smaller masses. One stage farther on, and in the place of the former cyst, we found a spherical mass formed by a multitude of giant cells included in a fibrous shell. (See Fig. 2).

"Out of these clumps which had preserved the dimensions and the form of the cyst for which they had been substituted groups of giant cells were found surrounding small fatty masses, isolated one from the other by a less dense fibrous tissue spotted with inflammatory deposits. These bands were polymorphic, and included macrophages with one or two nuclei, filled up with albuminous deposits of a filamentous or leaf-like aspect, with droplets of neutral fats, and of small fatty acid crystals, macrophages of small size, plasmocytes, and *Mastzellen*.

"In certain regions the giant cells are lacking and the polymorphous inflammatory bands, very poor in fat inclusions and separated by large collagenous bundles with very delicate fibrils, alone persisted. The fixed cells were found between these bundles, and not in their interior.

"If we may orientate the more or less confused lesions which are revealed in our microscopic preparations, we arrive at the conclusion that they represent the stages of the same process which the Meibomian glands have successively reached. At the beginning these glands have undergone a cystic dilatation, with degeneration of the secretory elements which have converted them into milia. From this stage, a histiocytic reaction has been established by contact with them. The epithelium undergoes atrophy and disappears when the histiocytes, which have passed into the cyst, resorb its contents. The resorption ended, the phagocytic cells are rarefied, and an exuberant cicatricial mass, poor in fixed cells, and rich in fundamental substance, similar to a cheloid acne, alone persists. This fundamental substance did not present the homogeneous appearance of amyloid or hyaline material. The search for amyloid deposit by the Paris violet, iodine and Congo-red stains was quite negative.

"Summing up, we have to do with a progressive degeneration of the Meibomian glands, the remains of which determined the production of foreign body granulomas, and a cheloid hyperplasia of the tarsal conjunctival tissue."

Desiring to complete his anatomico-pathological report, Prof. Masson asked me to give him another biopsy of the tarsus, this time covered by the conjunctiva. A few months later, I furnished him the piece he required, on which he reported:

"The portion removed was cut perpendicularly to the surface of the conjunctiva, and at the palpebral border. It contains on the surface a Malpighian stratified epithelium, almost everywhere of mucous type, with a cylindro-cubic surface only in the neighbourhood of its superior limit. Here and there this covering presented small islets of cells of keratohyalin, covered with keratinized cells. Everywhere this epithelium was bordered by spongiosa, and penetrated by numerous polymorphonuclear cells in diapedesis. Throughout we found conjunctival glands, sometimes normal, sometimes dilated, and more or less cystic.

"Immediately underneath the surface, and round about the glands, the superficial layer presented a lymphocytic and, especially, a plasmocytic infiltration in sheets. Here and there the infiltrating elements were in rounded masses, follicular in appearance, and formed either of lymphocytes or of plasmocytes. Under this infiltrated layer was found a mass of fibrous conjunctival tissue of cicatricial appearance, slightly oedematous, which formed the greatest part of the removed tissue. There is no clear limit between the infiltrated superficial layer, and this fibrous tissue which is invading and forms a continuation the one

with the other. The inflammatory infiltration progressively becomes less marked from the surface towards the depth, where it entirely disappears. This deep region, moreover, is remarkable for the number and considerable size of the arteries and veins.

"This deeper portion presents the greatest structural analogy with the appearances in the first tissue removed. As in the former case it corresponds to a hyperplastic sclerosis in relation with the chronic in-

flammation of the surface. But we are quite unable to determine the etiology of this inflammation."

As I presumed that it would be interesting to have a histo-pathological report on the hypertrophied skin of the patient, I made a biopsy on the forehead, in the middle between the eyebrows, and entrusted it again to Prof. Masson.

"The fragment of the skin removed by biopsy measured 5 mm. in thickness, and included in its

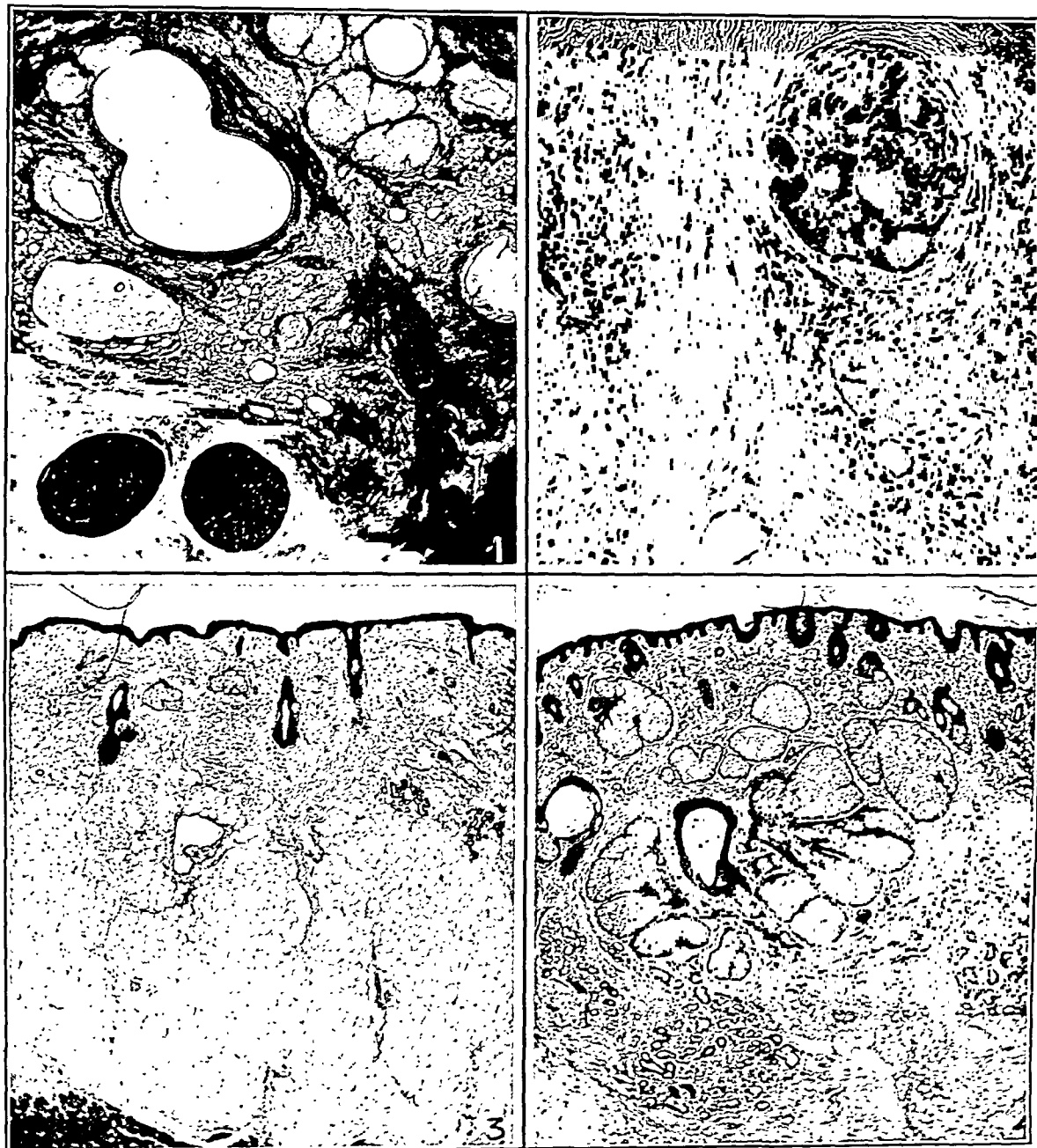


Fig. 1.—Early stage of cystic sebaceous glands; conjunctival tissue is infiltrated with macrophages invisible under this magnification. Fig. 2.—More advanced stage. A group of giant cells containing remains of a degenerated sebaceous gland, completely destroyed; to the left of this mass a fibrous band, and on both sides of it, columns of macrophages with fatty inclusions. Fig. 3.—Section of the normal skin in the frontal region (low power). Above, the dark wavy line represents the epidermis; beneath, in gray, the derma, where hair follicles are found, cut obliquely. Between the two follicles on the left are two multilobed sebaceous glands; to the right, quite close to the derma, two sudoriparous glands. Fig. 4.—Hypertrophied skin of the patient (same magnification). The epidermis has given rise not to 3 but to 17 well-defined hair follicles. Numerous deep projections having the appearance of elongated epidermic papillae are probably rudimentary hair follicles. At the left and towards the middle of this figure are the sections of two large hair follicles. Around them, or isolated in the derma, we recognize gigantic and multilobed sebaceous glands. In the deeper part of the derma, four or five times thicker than normal, are three groups of sudoriparous tubules. The middle one presents forty divisions, and its duct is clearly enlarged

depth only an insignificant layer of the panniculus adiposus. The firm and compact tissues which formed it completely seemed, at first sight, to be constituted by the epidermis and a derma four or five times thicker than the normal skin of the frontal integument. (See Fig. 3).

"On microscopic examination, under a low power, this impression was modified slightly. The thickening of the derma is due less to a definite increase of its connective tissue than to the number and size of the epidermal derivations which have developed there in excess and have encroached on the deeper portion.

"The epidermal layer presents only a scanty covering for the papillae. There are pilo-sebaceous follicles closely packed together, with, here and there, the excretory ducts of the sudoriparous glands. The hair follicles are broad and short, their bulbs scarcely extending beyond the middle zone of the derma. Their hairs are pigmented and implanted more or less obliquely. (See Fig. 4).

"The sebaceous glands, of varying size, but most often large, occasionally multilobed and gigantic, are closely related to them. Certain of these sebaceous follicles are four and five times greater in linear dimensions than those of the normal skin of the forehead. A number of follicles present slight inflammatory lesions, with lymphoid and plasmocytic infiltration of the connective tissue which surrounds them. Certain of them have disappeared and their place is marked by nodules with giant cells. Immediately beneath this derma, thickened by the excessive development of the pilo-sebaceous follicles, we find a layer, 1.5 mm. thick, which corresponds topographically to the superficial region of the subcutaneous layer, but the fatty tissue is scanty; it is replaced by enormous sudoriparous glomeruli separated from each other by their cellular and fatty partitions.

"The secretory tube of these glomeruli is so long and so convoluted that in certain preparations it was cut across twenty, thirty, and even forty times; here and there it shows branching. Its diameter is enlarged; the cells which constitute it are abnormally large, tending to be heaped up in two or three layers; and the deformed secretory lumen assumes a wavy appearance. The secreting cells do not present any structural anomaly, except for the frequent presence of two or three nuclei, probably signs of amitotic multiplication. Nowhere do we find mitosis. Finally, in some glands the intermediate segment which connects the acinus and the excretory duct is distended, manifestly from obstruction. (See Fig. 5).

"The deep derma, the panniculus adiposus between the sudoriparous glands and beneath them, as well as the regional nervous filaments, are infiltrated with a trifling œdema but one which is strongly albuminous, without exudation of cells, which the lesions of folliculitis, as it is very superficial and very distant, cannot explain."

Drs. R. Amyot and H. Gélinas, physicians to the Notre-Dame Hospital, have kindly furnished me the following clinical notes.

"General physical examination. — Condition good. The heart and the lungs normal. Arterial pressure 130/80, as a rule. The liver and the spleen are of normal size.

"The head, which is more developed than usual, had not enlarged for many years. The tongue was of a normal size. No inferior prognathism. The thyroid gland was not hypertrophied.

"A painless hydrarthrosis of the left knee was present. The liquid withdrawn was sero-fibrinous.

"The secondary sexual characters were normal. Genital functions normal. Mental state normal. Neurological examination, negative.

"Apart from the organs and viscera, the clinical examination disclosed certain pathological changes, and it was particularly in the face and limbs that the signs

were manifested. The skin of the face was thickened, the wrinkles were numerous and very deep, and the eyelids offered this anomaly, which, from the ophthalmological point of view, constitutes the subject of the present work.

"The distal parts of the four limbs, comprising the lower third of the fore-arms and legs, the wrists and hands, the ankles and feet, are the seat of a symmetrical hypertrophy of considerable degree. This increase in volume enlarged the transverse diameter of these structures, and thickened considerably the feet and hands and



Fig. 5.—High power view of sudoriparous tube; hypertrophied skin of the patient. The lumen is large, bordered by cells of unequal size. Some swollen and bulky cells contain two or three nuclei. To the left are two capillaries.

their respective digits. It also involved the nails which were enlarged and had the shape of a watch glass. (See Figs. 6 and 7.) The skin was dry and inelastic and the fingers were thick and stumpy. The thighs and arms were not increased in volume. The temperature of the limbs was normal. No incurvation of the legs."

"Laboratory examinations.—The Wassermann test was negative. Urine normal. Urea 0.35 centigr. per 1,000 c.c. Calcium of the blood, 0.106. Cholesterol in the blood, 1.97 g. Phosphates, 34.21 mg. Basal metabolic rate, + 2 per cent.

"Provoked glycaemia.—1.12 gr. fasting. 1.42 gr. after ½ hr. 1.30 gr. after 1½ hr. 1.10 gr. after 2½ hrs.

"The amount of the ionized calcium was 17.09 mg. to the litre. (Formula, Rona-Takahashi).

"To sum up, the chemical and serological examination of the blood did not show anything abnormal, other than a pronounced diminution of the ionized calcium.

"Blood picture.—Red corpuscles, 4,000,000; leucocytes, 16,000; globular value, 0.9; polymorphonuclear cells, 52 per cent; large mononuclears, 5 per cent; lymphocytes, 26 per cent; lymphocytes of medium size, 11 per cent; metamyelocytes, 3 per cent; myelocytes, 2 per cent; basophiles, 1 per cent.

"The morphological examination of the blood showed a leucocytosis of moderate grade, with predominance of the mononuclears."

It would have been interesting to try interferometry; however, the patient was of the opinion that our re-

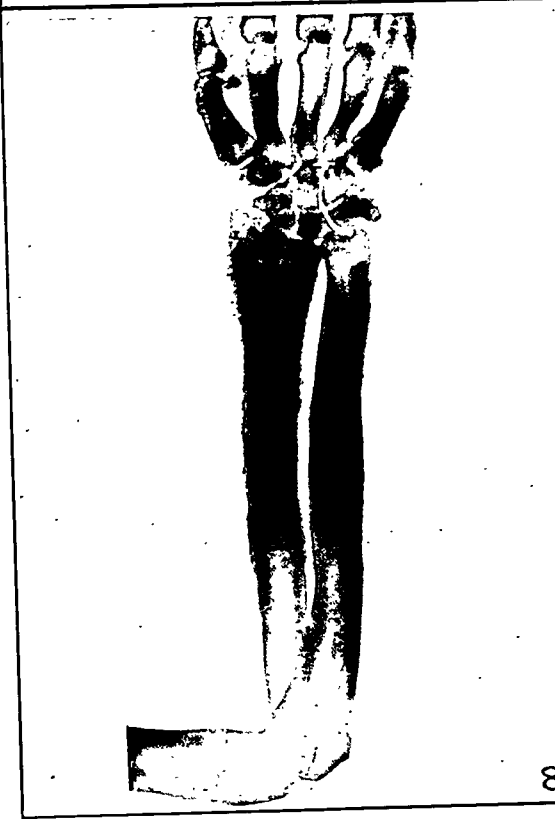


Fig. 6.—Bilateral and symmetrical hypertrophy of the tarsi. Fig. 7.—Bilateral and symmetrical keloid hypertrophy of the tarsi. Fig. 8.—Right ulna and radius. Fig. 9.—Increased thickness of the cranial walls, enlarged frontal sinuses, and a normal-sized sella turcica.

searches were sufficient, and refused to permit us to take any more blood.

We have had radiograms taken of the bony system, and have obtained some extraordinary pictures of quite unusual interest. Dr. A. Jutras, radiologist to the Radium Institute, has been good enough to furnish me with the radiological report.

"The long bones of the limbs are enlarged in their transverse diameter, especially at their distal extremities. The medullary canal has lost a little of its contrast, and encroaches in certain places on the compact bone. This latter is more delicate than normal and presents the appearances of fibrous degeneration; it has lost its usual homogeneity, and has assumed a reticular aspect, with meshes of unequal dimensions, somewhat elongated, and with the long axis roughly parallel to the axis of the bone. The outline of the bones is irregular, nodular, and with osteophytic outgrowths in certain regions, owing to an ossifying hyperplasia which envelops the bone from one diarthrodial cartilage to the other, including the extra-articular part of the epiphysis. Sometimes the peripheral outline is reduplicated, suggesting a bridge, and allowing us to assume the existence of an ossification of the periosteum.

"This general description, indicating resorption and calcareous regeneration, applies to the upper limbs, the collar-bones, the humerus, the ulna, the radius, the metacarpals and the phalanges. In the case of the lower limbs, it applies to the femur, the tibia, the fibula, the metatarsals and the toes. Moreover, certain epiphyses, such as the inferior epiphyses of the two ulnas, are the seat of a hypertrophy of bony spongy tissue. (See Fig. 8).

"Nor have the bony girdles and the short bones of the limbs been spared. The shoulder-blade has irregularities of contour and its trabecular structure is destroyed. The iliac bones, less affected than the other segments, do not present however a perfectly normal shape, especially in the sub-cotyloidian regions and below the anterior and inferior iliac spines.

"The antero-posterior projection of the patellæ presents a woolly aspect and an enlargement of its different diameters by a multitude of small exostoses. Here, as elsewhere, the profile view suggests an extra-articular localization of the hyperostosing process. The carpal and the tarsal bones also present asperities on their extra-articular surfaces. The periphery of the nails of the hand is emphasized by an opaque border, likely of a calcareous nature.

"The vertebral column is not radiologically normal, especially in the lumbar region, where we find the vertebral bodies deformed (bamboo picture), and osteophytes resembling in shape a parrot's beak; but these anomalies correspond to a common process such as is observed in certain subjects affected with rheumatism or senile degeneration.

"Nothing to note in so far as the ribs are concerned.

"The bones of the head, as demonstrated by radiogram, have undergone the following changes; increase of the external diameters of the skull, thickening of the vault, and, finally, enlargement of the frontal sinuses. That the sella turcica is normal should be particularly noted. (See Fig. 9.)

"We have in short to do with a bony dystrophy, hitherto undescribed, characterized, in the bones of the limbs, by a fibrous degeneration of the cortical layers and a diffuse ossifying hyperplasia of the periosteum which has brought about an increase in their diameter, especially in the distal portions; in so far as the bones of the skull are concerned, by the sclerosis of the walls of the roof, and the enlargement of the frontal sinuses."

SUMMARY AND DISCUSSION

In summing up the salient features of the multiple lesions in this case. I would say that these

present a hyperplastic and degenerative disturbance of certain connective tissues—bones, periosteum of the long bones, skin and subcutaneous tissues of the face and extremities of the limbs, and, above all, of the tarsus of the eyelids. This observation, characterized by a trilogy, allows me to describe a new disease having for its manifestations a hypertrophy of the eyelids, of the integuments of the face, and of the extremities of the limbs, and also of the bony system in general, caused most probably by an endocrine disturbance. Neglecting for the time being the hypertrophy of the integuments of the eyelids, face, and extremities of the limbs. I shall consider first that part of the syndrome which refers to the skeleton, and compare it with the different affections already known.

Though appearing like acromegaly, this syndrome does not present any of the essential features of this disease, so well described by Pierre Marie. Indeed, the disease of my patient appeared during infancy without gigantism; its evolution has been stationary for many years; the sella turcica is not enlarged; there is no lambdoidal projection; no prognathism of the inferior maxilla; no macroglossia; there are no evident neuro-vegetative troubles; no ocular symptoms; and the hypertrophied bones present osseous and periosteal lesions not found in acromegaly. Finally, induced hyperglycæmia shows good utilization of the carbohydrates.

We need hardly consider Paget's disease, because this affection, far from manifesting itself during infancy or adolescence, appears only at a late period of adult life; it is progressive; it causes most often an increase in volume of the skull and collar-bones; it produces a particular deformity of the tibias; it favours the onset of spontaneous fractures; it does not modify the integuments nor cause hypertrophy at the extremity of the limbs; and it is accompanied by pain, local elevation of temperature, and vertebral lesions different from those we have described. It also presents cardiac disturbance, and radiography demonstrates bones which have a characteristic wadding-like aspect that we do not find in my patient. The periosteal outgrowths alone have this appearance in my plates. The bone itself presents, rather, where its texture is definitely modified, an areolar aspect.

In Recklinghausen's disease of the bone, the periosteum is not involved; the bones are not increased in volume; the disease manifests itself during the adult period; the evolution is progressive; spontaneous fractures can be observed; the calcæmia is more considerable and phosphatæmia lessened; the extremities of the limbs are not hypertrophied; and, finally, we find the specific lesion in the substance of the bone, which is constituted by clear-cut cysts or deep areas of decalcification.

Nor do we have to do with the condition known as "marble bones", the generalized sclerosing osteitis of Albers-Schönberg, which is never accompanied by bony hypertrophy. This osteitis invades the whole skeleton; it develops with progressive anæmia; the opacity to x-rays is very considerable; and the integuments of the extremities are normal. Further, the affection is hereditary, and nearly always, manifests itself early in life. I shall eliminate also the melorheostosis, the osteopécilia, and the pneumo-chondrodystrophy of Pierre Marie.

I cannot admit that we have to do with an infectious process in the bone and periosteum. Indeed, no infection could provoke lesions so diffuse, so symmetrical, and so slightly progressive as those observed in my case, and which, at the same time, would be capable of originating a hypertrophy of certain integuments. Even syphilis, which attacks the bony system so often, could not produce such an array of symptoms. I am of the opinion that it is impossible to classify the syndrome of this patient in the category of any affection described hitherto, whether osseous, cutaneous, or palpebral. Consequently, I can only advance a hypothesis in regard to the etiology, a hypothesis based upon our endocrinological knowledge and on certain morbid factors concerning the relations of the patient and the place of his birth.

I shall only recall that this patient belongs to a goitrous family, that he was born and brought up in a locality where hypertrophy of the thyroid gland is endemic, probably due to the quality of the water and of food stuffs, conditioned by the nature of the territory in question. Considering these facts, I believe that I am in a position to group the different lesions he presented in one sole entity, constituting a true disease of certain connective

tissues which I attribute to one single cause, and that of an endocrine nature. The hypertrophy of the palpebral tarsus, of the integuments of the face and extremities of the limbs, as well as the hyperplastic fibrous osteoperiostosis should be attributed to an upset of endocrine function in direct relation with an hereditary vitium transmitted by goitrous parents, or acquired as a result of a local pathological factor which maintained a hypertrophy probably associated with thyroid derivation. I place in the forefront of this imbalance certain physiological disorders of the thyroid and parathyroids. We have known definitely for some years that a functional disturbance of the last-mentioned glands has the power to provoke a perversion in the process of calcification of the bones and a mutation of the calcium, manifesting itself, on the one hand, by a fibrous degeneration of the cortical zone, and on the other, by a sub-periosteal bony proliferation. If it is true that the sclerosis can be localized to one or to many organs there exist also numerous pathological cases in which this process can be generalized. The action of the parathyroids, therefore, could manifest itself on the connective tissue of one only, or of a group of organs, or even of all the organs of the body. In the case of my patient the sclerosis was localized to the tarsus of the eyelids, the integuments of the face, the extremities of the limbs, and of the bones. I think I can submit the hypothesis that the parathyroids have contributed in large part to its etiology. As the endocrine action manifested itself during the period of growth, at least in so far as the bones are concerned, this particular feature in its evolution explains perhaps the atypical character of the bony lesions. In spite of the fact that with radiography the sella turcica appeared perfectly normal, in view of the increase of the external diameters of the skull, the thickening of the cranial vault, and, finally, the considerable enlargement of the frontal sinuses I am, nevertheless, of the opinion that the hypophysis is responsible for all the disturbances just specified.

The non-progressive character of the syndrome in my patient leads us to conclude that his affection completed its course long ago. In so far as the hypertrophy of the eyelids, and integuments of the face is concerned, it is eas-

to come to the conclusion, on consideration of Fig. 7, taken eight years after the first one, (Fig. 6) that the small difference observed in these two pictures is due to the progress of age rather than to the continuation of the pathological process.

In so far as the hypertrophy of the palpebral tarsus is concerned, perhaps one should not totally ignore the ocular irritation produced by smoke, when the patient was twenty years old, an irritation which in the space of about two months necessarily resulted in a chronic conjunctivitis. And, besides, I must point out that the palpebral troubles made their appearance in the fall of the same year. This inflammation, in its turn, has perhaps participated in the development of such a strange disease of the tarsus, because the endocrine or humoral pre-

disposition of the patient was of a nature to favour the reaction of fibrous hyperplasia.

CONCLUSION

I have detailed here a syndrome, hitherto undescribed,—comprising a trilogy, characterized by bilateral and symmetrical keloid hypertrophy of the tarsus of the eyelids, increased volume of the integuments of the face and of the extremities of the limbs, associated with an atypical osteo-periostosis generalized in almost all the bones of the skeleton—a syndrome caused, in my opinion, by an endocrine disturbance, and quite probably by the parathyroids and the hypophysis.

I desire to extend my sincere thanks to several colleagues who have assisted me in various ways in the study of this case: Professors Pierre Masson, J. E. Gendreau; Associate Professors L. C. Simard, A. Bertrand; and Drs. R. Amyot, H. Gélinas and A. Jutras.

THE SURGICAL TREATMENT OF CHRONIC RADIATION DERMATITIS*

BY STUART GORDON,

Toronto General Hospital,

Toronto

RADIATION dermatitis is a lesion which, in spite of all known precautions, still presents a problem in treatment. The early and unguarded use of x-rays resulted all too frequently in most distressing lesions. Many theories were advanced in explanation, such as the formation of ozone in the tissues, decomposition of water in the tissues, heat, an unidentified ray, platinum particles from the tube. By the beginning of this century it was at last recognized that responsibility for the lesions belonged to the active x-ray tube. Today appropriate shielding, filtering, and controlled dosage have resulted in a marked decrease in the number of cases, in spite of the fact that radiation is being employed more and more widely.

Patients suffering from radiation dermatitis have been divided by Porter into three clinical groups: first, those who have received a single therapeutic or diagnostic dose; second, those who have received repeated doses at intervals; and, third, the personnel administering the treatment and who have suffered injury. The

lesion in the first group may be due to an individual idiosyncrasy, to the radiation of an area in which vascular damage is already present, or to heavy dosage by design. Thus the development of a radiation dermatitis is not evidence of faulty or careless technique. By far the largest clinical group is the second.

PATHOLOGY

Wolbach investigated the effects of the rays on the skins of animals, the results being compared with lesions found in the human being. The first structure to show change following radiation is the collagen of the corium, blood-vessels, and lymphatics. The change consists of a swelling and coalescing which produces an atypical collagen poor in cells. Regeneration does not take place in this changed connective tissue; instead, new connective tissue is laid down by the unaltered fibroblasts. This same process occurs in the walls of affected blood-vessels and results in a gradual obliteration. The slow occlusion of these vessels accounts for the latent period between treatment and untoward result. Telangiectatic vessels develop

* Read before the Division of Surgery, Academy of Medicine, Toronto, on October 15, 1935.

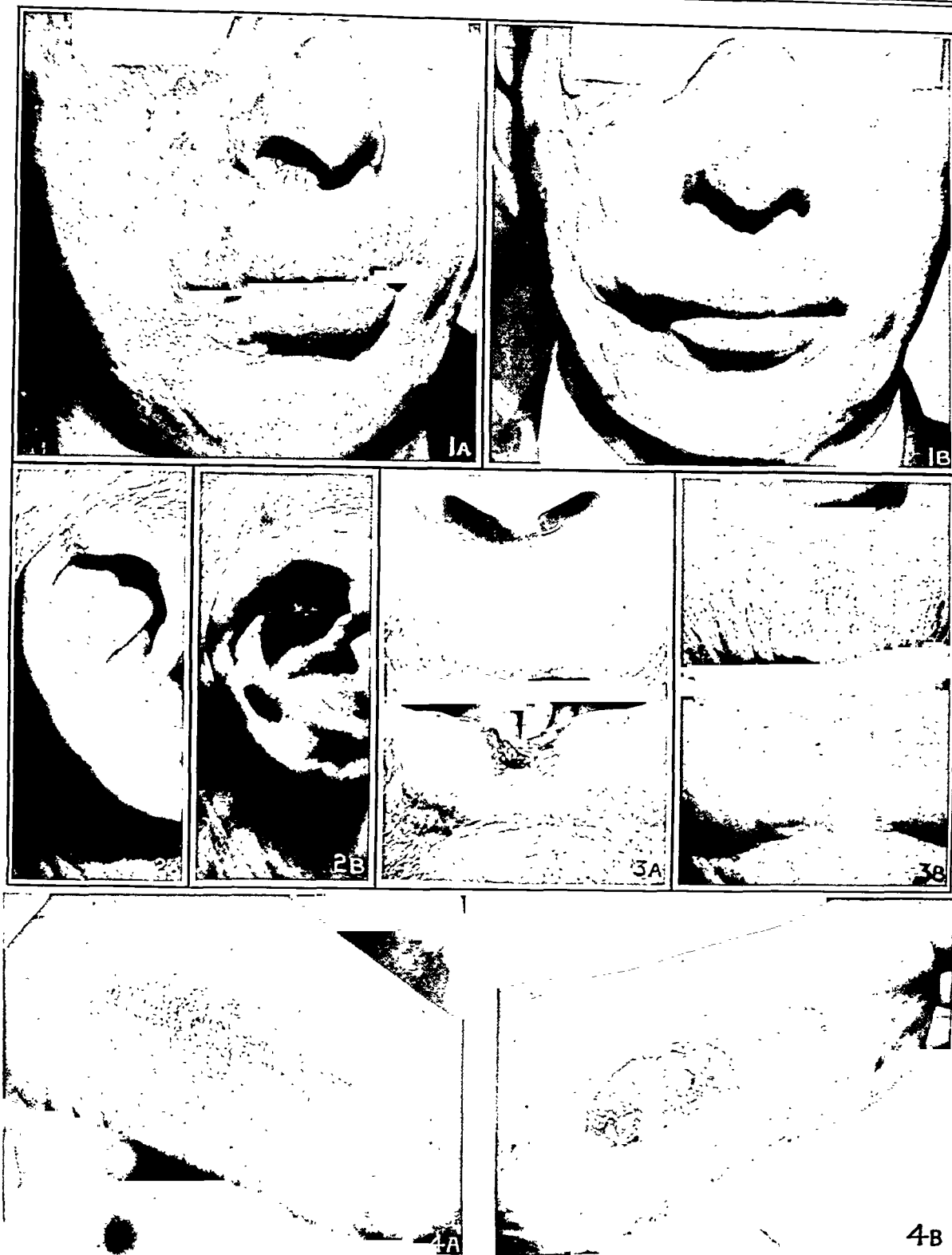


Fig. 1A.—Extensive lesion caused by radiation therapy of an hæmangioma. Radium had been first used twenty-four years prior to his reporting for surgical therapy. Ulceration had been present for the past five years. In February, 1934, the lesion was excised and a pedicle graft from the forehead swung down on a temporal artery pedicle. Fig. 1B.—The result obtained 18 months after excision. Graft on the upper lip is a pedicle graft obtained from the forearm, the graft on the nose and cheek from the forehead. The forehead defect has been repaired with a Thiersch graft. Fig. 2A.—Patient was treated for a rodent ulcer of the ear in January, 1932. During June, 1935, he developed a small, painful ulcer at the site of his previous lesion. Wide excision and resuturing was carried out in July, 1935. Fig. 2B.—Appearance of the ear in October, 1935. Fig. 3A.—Patient had implantation of radium needles in lower lip in 1926 for carcinoma. Lesion recurred in 6 years and was again treated by implantation of radium needles. In December, 1933, a small, hard, bluish area appeared in the centre of the lower lip. A sloughing, painful ulcer formed. During December, 1934, the lower lip was completely excised and the defect repaired by sliding in lateral flaps. Fig. 3B.—Result, 1 month after treatment by excision and repair. Fig. 4A.—Patient received radiation therapy to soles of both feet for a lesion of the plantar fascia in April, June and September, 1930. Reported in March, 1934, with a typical lesion on sole of left foot. This lesion was treated by excision and immediate Thiersch graft. Fig. 4B.—Result of treatment of lesion shown in 4A. Patient has been walking on this graft for 18 months without any untoward effects.

as the lesion progresses. These may appear within four months, although they are usually first seen during the second year following treatment. Thrombosis may occur in these vessels. A small area of local necrosis results. The epidermis may grow down and under the thrombosed vessel in an attempt to get rid of it, and at the same time to maintain an unbroken epithelial surface.

The epidermis apparently is not affected directly by the ray, the changes occurring in it being secondary to changes in the corium. Typically, in the chronic case, the epidermis becomes thin, white, and loses its hair, sweat and oil glands. The superficial cells remain attached to each other, to produce poorly keratinized masses—the hyperkeratoses of the chronic lesion. This activity on the part of the epithelium, in an abnormal tissue, may eventually result in a definite malignant change.

CLINICAL SYNDROME

Two clinical types are to be found, the acute, and the chronic. The former develops rapidly after exposure and is due to actual cell death. An irregular shallow ulcer results. The surrounding margin is inflamed, though not acutely, and sodden, the edges low and slightly shelving. The surface is composed of a dense yellowish, shiny, homogeneous-appearing tissue, and the discharge is thin and irritating. The lesion is usually quite painful, the pain being burning in nature. A few months to many years may be the latent period of the chronic type of radiodermatitis. A period of 20 years has been known to elapse between treatment and the development of the lesion.

The first change to appear is a brownish pigmentation in the radiated area. This usually fades in a year. Telangiectases appear in the thin, dry, hairless skin. These may be few or may be very diffuse and abundant. Dark areas of thrombosis appear, the so-called “coal spots”. As the corium gradually thickens the whole area tends to move as one piece when touched by the examining finger. The patient complains of itching and burning in the involved area. These symptoms may be very persistent and cause great discomfort. Hyper-

keratoses develop, tiny cracks appear in the skin, and eventually ulceration supervenes. Finally, malignant changes may develop in the ulcerated area.

TREATMENT

The surgical treatment of chronic radiation dermatitis is directed towards the relief of symptoms, the repair of deformity, and the removal of the danger of malignant change. Small acute lesions may respond to appropriate local treatment. Briefly, the surgical treatment consists in adequate excision followed by some type of plastic repair. As the extent, location, and degree of the lesion varies in each patient, and as patients vary in their opinion of a satisfactory repair, it will readily be seen that each case presents an individual problem.

By plastic repair is meant the use of some type, or types, of skin grafting. Grafts are divided into two main groups, the attached, which have been used from time immemorial, and the free, which have been in use for approximately 65 years. The attached include the direct and indirect pedicle grafts; the free grafts are the pinch or Reverdin, the Thiersch or razor graft, and the full thickness, or Wolfe graft. Any one or any combination of these grafts may be used in the repair of chronic radiation dermatitis. The choice depends upon the amount of time available and the cosmetic effect desired. The majority of cases are treated by wide excision followed by a Thiersch graft.

Excision and plastic repair of chronic radiation dermatitis relieves the itching, burning and pain, improves the appearance, lessens or removes the deformity, and eliminates the potential danger of malignancy.

BIBLIOGRAPHY

1. COLWELL, H. A. AND RUSS, S.: X-ray and Radium Injuries — Prevention and Treatment, Oxford University Press, 1934.
2. GILLIES, H. D. AND MCINDOE, A. H.: Role of plastic surgery in the treatment of chronic radiodermatitis, *Ann. Surg.*, 1935, 4: 101.
3. MACKEE, G. M.: X-rays and Radium in the Treatment of Diseases of the Skin, Lea & Febiger, Phila., 1921.
4. PORTER, C. A.: The surgical treatment of roentgen-ray lesions, *Am. J. Roentgenol.*, 1925, 13: 31.
5. WOLBACH, S. B.: A summary of the effects of repeated roentgen-ray exposures, etc., *Am. J. Roentgenol.*, 1925, 13: 139.

SYPHILIS OF THE PLACENTA*

BY P. J. KEARNS, M.D., C.M., M.Sc., M.C.O.G.,

*Clara Law Fellow in Obstetrics and Gynaecology, McGill University,
Montreal*

THE modern-day belief in selective child-birth as brought about by a generalized knowledge of the physiology of conception and the ever-growing demand of economic pressure has resulted in the proper spacing of pregnancies and the limitation of the number of children born to each individual family. The average age of marriage is more advanced, resulting in a shorter period for fruition. These well known facts have placed the accoucheur in a more responsible position to the parents, because when called upon he is supposed to produce a normal, healthy child. He must, therefore, examine more carefully for the diseases of the mother which cause fetal wastage, in order to preserve this small, selected family. Fetal wastage is greatly augmented by that well known disease, syphilis, a disease which occurs in 10 per cent of pregnant women, ranging from 1 per cent in our own district to an unforgivably high mark of 16 per cent in the coloured races to the south. Twenty per cent of syphilitic pregnant women bear dead-born babies, ranging from 1½ to 7 months' gestation. Ten per cent of syphilitic children born alive die in infancy or childhood from syphilis or from intercurrent diseases.

Fifteen years ago, in this institution, a routine blood examination for syphilis was part of the general examination of the patient. This resulted in a widespread fight against and practical elimination of syphilis. We then passed into a period of quiescence from the disease resulting in the elimination of the Wassermann test from the general routine medical examination. Consequently, slowly but silently, the disease again claimed victims unknown to themselves, and now we are again compelled to place the Wassermann test in our routine examination.

In 1932 we noticed that 4.8 per cent of the total number of placentas sent to us for examination showed histological evidence of syphilis. The follow-up Wassermann test on

these cases gave 66 per cent positive results. In 1933, because of experimental study going on in this department upon the placenta, the percentage was greatly altered. In 1934 10 per cent of the placentas sent to us showed histological evidence of syphilis, and 50 per cent of these women were found to have four-plus Wassermann reactions. During 1934 the clinic instituted a routine blood Wassermann test and this is being taken upon the first visit of the patient to the clinic. During the first seven months of 1935 we examined histologically 85 placentas, of which 14, or 16.5 per cent, showed a histological suggestion of lues. Eight of these, or 57 per cent, had positive Wassermann tests.

How do we explain this variable picture which we see in placentas of syphilitic fetuses? It is best understood by studying the method of infection from the mother to the fetus. It has been shown by Ssolowjew that the spirochæte can pierce through the chorionic layer without doing damage, because he found one half way through the epithelium of a normal villus. Bianca Bienenfeld, and also Frankl,¹ showed spirochætes in the villous stroma which had not excited any local tissue change. We must also consider that placental changes are often late manifestations of lues. The internal parenchymatous tissues of the fetus, such as the liver and the kidney, are usually damaged considerably before the external parenchyma of the fetus, the placenta, shows any pathological change. We must also remember that the spirochæte stimulates proliferation of mesodermic connective tissue and retards proliferation of mesothelial and epithelial structures. The same atrophy of chorionic epithelium in the placenta goes on as does atrophy of liver epithelium, with consequent increase in connective-tissue content. We must also consider that syphilis tends to produce endarteritic changes with a gradual diminution in blood supply to the tissues affected (Fraser, 1923²). We must not forget that in an organ like the

* Read at the Royal Victoria Montreal Maternity Hospital before the Obst. and Gyn. Travel Club of New York, on December 2, 1935.

placenta, where an active double circulation exists, with a gradual anatomical change in the size and shape of the intervillous spaces that goes on with ageing, the intervillous spaces will be altered according to age. If we bear these facts in mind it becomes much easier to determine and to remember the histological changes that ensue in syphilis of the placenta. The histological picture of the placenta will then be determined according to its age.

Observation, palpation and injection of the normal placenta at six months show a comparatively thin, plate-like placenta with a fine

villous circulatory bed. The parenchymatous organs of the fetus now increase their metabolism; the fetus grows faster, and consequently demands more nourishment. The placenta responds to the increased demand put upon it by showing a more active proliferation of syncytium, producing numerous small buds growing out from the main villi like a tree budding in springtime. This proliferation of syncytium is more active at the distal part near the decidual, or maternal, surface. Small villi are now seen in gradually increasing numbers, crowding the intervillous spaces but

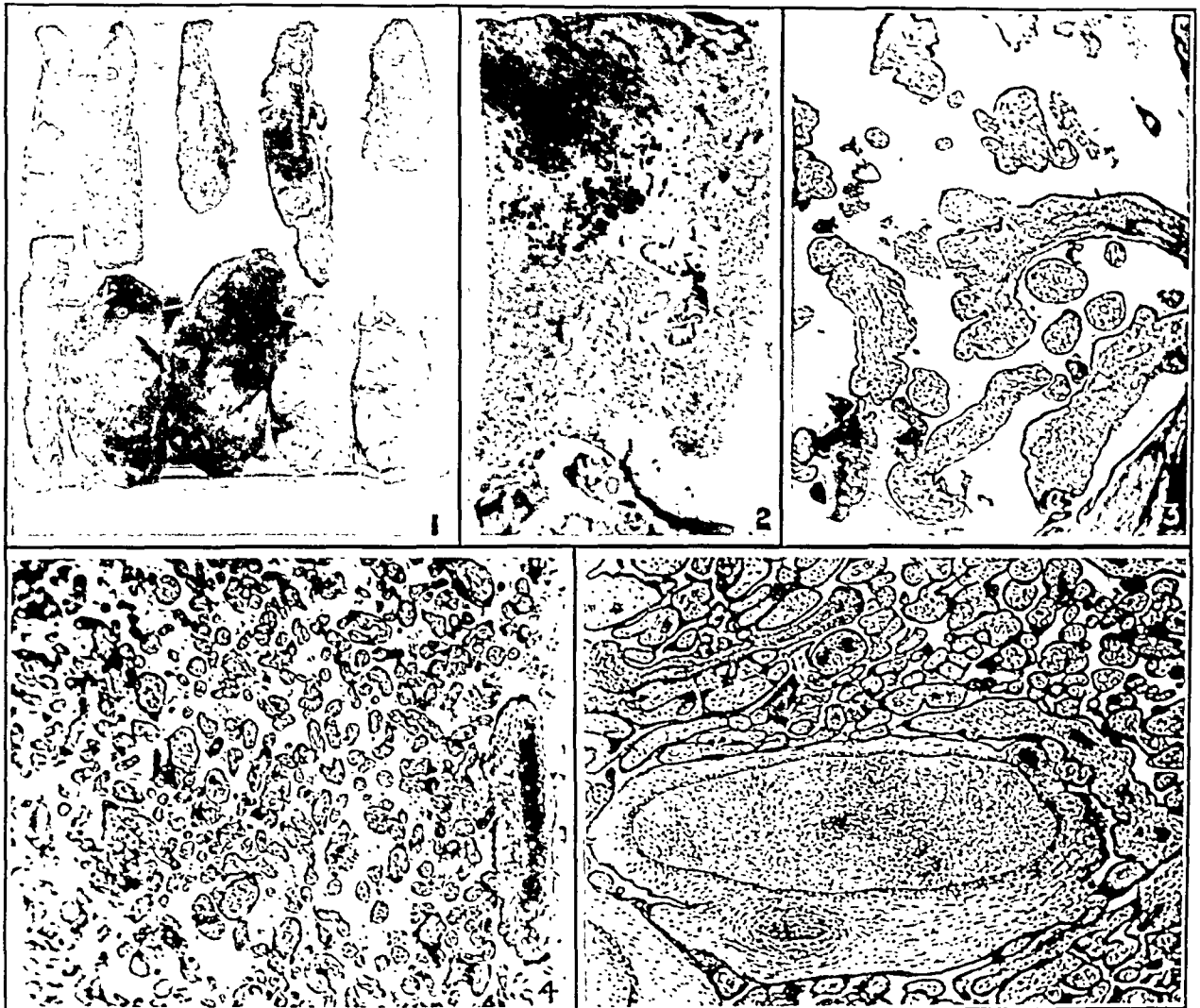


Fig. 1.—Upper row; left to right: A small, atrophic, necrotic placenta. A large, thick, heavy homogeneous, hyalinized placenta. Placenta showing fetal infarction. A large, thick placenta showing various stages of maternal infarction. A thick, bluish, wet placenta; thrombosis in main subamniotic vessels. Bottom row; left to right: Numerous reddish sequestra; diffuse maternal infarction. Large, round, thick, heavy, bluish, wet placenta of venous congestion. Looks like pneumonic lung. An irregularly thickened, greyish-pink, inelastic, non-infarcted placenta typical of syphilis. Fig. 2.—Sagittal section through a thick mature placenta. Note the density of tissue near the maternal surface where syphilitic changes were found. Fig. 3.—Photomicrograph of 5 months' syphilitic placenta. Note change in architecture, loss of tapering effect of the villi, atrophy of chorionic epithelium and increase in mesodermic stroma. Fig. 4.—A normal mature placenta. Numerous small proliferating villi. Intervillous spaces free. Fig. 5.—The typical syphilitic placenta: exudate in walls of sub-amniotic vessels and in the walls of the large vessels. Crowded intervillous spaces. Toxic conglomerations of syncytium. Cellular villous stroma and loss of spindle arrangement of chorionic epithelium.

never normally touching each other. In the ninth month the placenta is entirely constructed of numerous small villi which are covered by a thin hyalinized syncytium lying parallel to the surface.

A suggestive diagnosis of syphilis of the placenta can be made if one carefully follows out a strict routine macroscopic examination. All blood clot should be washed off the freshly expressed placenta, which should be carefully palpated and weighed. With a long sharp knife cut the placenta from edge to edge at intervals of about three centimetres, leaving the chorionic membrane intact. With the placenta open like an accordion note the thickness and consistency.

Not all thick heavy placentas are pathognomonic of syphilis. Occasionally we see a very large, overgrown, over-mature placenta without any pathological change. We frequently see a thick, heavy, pinkish, glassy-like, homogeneous placenta due to a rapid spread of hyaline material throughout. The fetus often dies during labour with this type of placenta. We also occasionally see a very thick, yellowish, gelatinous placenta associated with erythroblastosis of the fetus. In this case the fetus is tremendously œdematous. The thick, heavy, wet, bluish, soft placenta, looking like a pneumonic lung, is due to a chronic venous congestion of both circulations of the placenta. This is a toxic manifestation. There is also the thick, infarcted placenta with numerous soft, reddish sequestra and occasional areas of white infarction.

The typical syphilitic placenta is thick, greyish, firm, dry, and does not show evidence of maternal infarction; but where there has been a toxic manifestation in the placenta before it was affected by syphilis infarction is frequently seen and is more marked near the chorionic membrane. Late syphilis of the placenta more frequently produces near the maternal surface thick, reddish-grey, firm areas, because this is the path of growth and proliferation. We have noticed that many placentas do not show syphilitic changes in that portion near the chorionic plate. Here one may see large masses of hyalinized, atrophic villi with much evidence of senile change, yet if sections are taken near the maternal surface a typical histological picture of syphilis is seen. For this reason we

find it advisable to take sections extending from the chorionic plate to the maternal surface.

The histological features of a syphilitic placenta at six months' gestation are difficult to determine because of the persistence of proliferation of trophoblast and also the large amount of villous connective tissue present. We have said that syphilis retards epithelial growth. We get, therefore, broad, stunted, club-shaped villi, Gothic in architecture, with a decrease in the powers of proliferation of chorionic epithelium. Normally the villi at this age should be more tapering, Romanesque in architecture, with active syncytial proliferation. The intervillous spaces are still large at this period of gestation, and any appreciable increase in connective-tissue proliferation does not sufficiently enlarge the villi to obliterate large intervillous spaces. Consequently, the villous surfaces do not touch and there is a lack of conglomeration of syncytial clumps. There is also no appreciable change in the structure of the villous vessels and there is less tendency for exudates in the walls of the sub-amniotic and cord vessels.

In the syphilitic placenta of seven months the overgrowth of connective tissue, especially in the newly formed villi, produces larger, coarser villi. There is also a slowing in the degeneration of the old villi because of their large content of mesodermic tissue which does not degenerate easily. These two combined changes cause the intervillous spaces to be gradually encroached upon, with resultant touching of the chorionic epithelium of adjacent villi. There now form toxic conglomerations of chorionic epithelium in the intervillous spaces. This is a most reliable and constant finding and is first noticed about the seventh month. Other finer observations show thickened, obliterated villous vessels and a tendency to round-cell exudate in the walls of the sub-amniotic vessels. When the sub-amniotic vessels show an intra-mural exudate usually the cord vessels near the fetal surface of the placenta also show it. Other points which I have noticed are that the villous stroma often produces a more cellular arrangement of connective tissue cells, because it is proliferating more rapidly, and the chorionic epithelium also shows a tendency to produce more round.

separated cells which lie adjacent to each other but do not form the long, linear, parallel, hyalinized strips that are normally seen. These points become more accentuated in the last months of pregnancy.

We have now begun, in this clinic, a routine examination of all cord bloods where the Wassermann test in the mother is positive. This is done with a dark field illumination and is being carried on by Dr. J. C. Whyte. This, I hope, will prove to be a profitable and helpful measure in the investigation of syphilis in the fetus.

Syphilis of the placenta may, therefore, be classified under: (1) vascular and endarteritic changes; (2) the presence of exudate in the walls of the sub-amniotic and cord vessels; (3) atrophy of epithelial structures; (4) prolifera-

tion of mesodermic tissue; (5) gradual obliteration of the intervillous spaces, with toxic conglomerations of epithelium in the intervillous spaces. (The age of the placenta must be determined when using this factor).

Helpful measures are the proper sectioning of the placenta, a search for spirochaetes in the cord blood, and a serological study of the mother's blood. Since we have established this routine in our clinic we have noticed a sharp rise in the percentage of syphilitic placentas detected.

I am indebted to Mr. W. J. Plumpton for his assistance in preparing this paper.

REFERENCES

1. FRANKL, O.: *Leipmann's Handbuch der Frauenheilkunde*, Band 11, Leipzig, 1914.
2. FRASER, J. R.: Placental circulation, *Am. J. Obst. & Gyn.*, 1923, 6: 645.

PENTOTHAL: A NEW INTRAVENOUS ANÆSTHETIC*

By KENNETH M. HEARD, M.B.,

Toronto

THE induction of general anæsthesia by intravenous injection has apparently had a fascination for the investigator since the earliest days of the specialty. More or less successful attempts have been made to use in this way such widely differing chemicals as ether, morphine, avertin and paraldehyde—to mention a few. To the barbiturates, however, must go the premier position, for it is they which seem to offer the greatest hope of providing a really satisfactory drug. Many of the vast array of barbituric acid sedatives have been tried in this way, notably sodium amytal and nembutal. Doses necessary to produce surgical relaxation are frequently followed by such prolonged unconsciousness or troublesome excitement that many of the advantages of these drugs are lost. Hence they have now been relegated more to the rôle of basal sedatives, to be supplemented by an inhalation anæsthetic. For this purpose administration by the mouth gives adequate results in most cases, and so the intravenous injection is not widely used as a routine but saved for selected cases.

An entirely new angle of the problem was revealed with the introduction, in 1933, of evipal (evipan), a drug closely related to the others chemically but differing widely in its action, giving complete anæsthesia for short periods, with very rapid and pleasant recovery. With many others, we¹ reported favourably on this drug in its early days, and since then a rapidly growing literature has hailed its world-wide use. It is now recognized as suitable only for short procedures (about 5 to 20 minutes), preferably those in which complete relaxation is not required for more than 3 to 10 minutes. In such cases recovery is complete in about 20 minutes. Its use has been remarkably free from accident, but certain difficulties have arisen, particularly a muscular twitching, amounting almost to convulsions, in susceptible patients or with large doses. While this reaction is not serious it interferes with relaxation. With restriction to suitable cases, however, evipal has established a place for itself. Therefore, when there became available another drug, offering similar advantages, plus prolonged and complete relaxation, we welcomed the opportunity of trying it. The manufacturers* placed at our disposal the first

* From the Department of Anæsthesia, St. Michael's Hospital, Toronto.

Read before the Section of Anæsthesia, Academy of Medicine, Toronto, on January 27, 1936.

* Abbott Laboratories, Chicago and Montreal.

supply available for experimental use in Canada, and our results have been so striking that we feel justified in offering a preliminary report. Much further work must be done before this drug can be accepted as suitable for general use. Probably further chemical research will evolve another and improved member of the group, but so good are the results with this one that it will go far in popularizing the intravenous route and preparing the way for its more perfect, but yet unborn, successor. Even if evipal is doomed to eclipse, it is deserving of our thanks, for its rôle of missionary in the field of short-acting, quickly metabolized anæsthetics.

The new drug was first used at the Mayo Clinic, in November, 1934, and Lundy² and Hale³ have published data dealing with 700 cases without mishap and with considerable satisfaction to their surgeons. Quite extensive pharmacological and clinical investigation has been carried out by Waters⁴ at the University of Wisconsin. These constitute the only reports available at the time of this writing, although similar work is, no doubt, under way at other centres or in the process of publication. Chemically, the drug is sodium ethyl (1-methyl butyl) thiobarbiturate. It was tentatively called "thiobarbiturate No. 8064", but the new name "pentothal" has now been officially adopted, since a number of other thiobarbiturates are being tested by the same and other chemists. It is a slightly yellowish, crystalline powder, rapidly soluble in distilled water, yielding a lemon-coloured solution, with an objectionable odour resembling garlic. It is supplied in ampoules containing 1.0 g. of the powder, from which is prepared a standard 10 per cent solution by the addition of 10 c.c. distilled water or normal saline. The dose is most conveniently expressed in cubic centimetres of this solution, or may be more accurately quoted in milligrams of the actual drug, since the solution contains 100 mg. to 1 c.c. Waters investigated the action in rats, rabbits and dogs when given by mouth, by rectum, and intravenously. He found it to be primarily a respiratory depressant, death being due to respiratory failure, with relatively little action on the heart. This allowed considerable latitude in resuscitation from overdoses. Given intravenously in dogs, the minimal lethal dose was 30 to 35 mg. per kilo, with about half that amount being needed for satisfactory anaesthesia. In comparison, the minimal lethal dose of evipal is 45 to 50 mg. per kilo but, as larger doses are required, the ratio of safety is slightly favourable to pentothal.

We present careful observations on 60 administrations at St. Michael's Hospital, in November and December, 1935. This includes the work of all members of the anæsthetic staff. The series, while small, embraces a wide range of operations, handled with almost uniform success, and a variety of post-operative developments which point the way to what may be expected.

A useful anæsthetic must be safe for the patient, and satisfactory not only to the anæsthetist but also to the surgeon during operation and the nurse during recovery. Twenty sur-

geons operated with pentothal alone. All except one were enthusiastic. Seven wards received patients, with less complaint than with any other recent innovation. The best comment is the work actually done. There was only one failure to obtain the desired relaxation (in hæmorrhoidectomy, in a very robust man). Relaxation equal to that with spinal anæsthesia was demanded but not obtained until supplemental nitrous oxide was used. All other operations were successfully carried out without inhalation anæsthesia of any kind. The post-operative course was uneventful, except in one case of suspected kidney damage, which will be described later. Full surgical relaxation was required and obtained in 39 cases, as follows: vaginal hysterectomy 1, appendectomy 2, curettage 3, 1st- or 2nd-stage prostatectomy 4, supplement to spinal 2, bronchoscopy 1, tonsillectomy 3, operations inside mouth 6, introduction of intratracheal catheter 5, enucleation of the eye 2, manipulation of fibrosed joints 4, fractures (Colles and metacarpals) 6. The remaining 20 cases were abscesses or biopsies in which little relaxation was required, although full surgical relaxation could apparently have been obtained if indicated. The patients were universally pleased with both induction and recovery.

Our use of pentothal was limited not by the degree of relaxation required but by the length of time it was to be maintained. The desirable limit is probably 20 to 30 minutes. Thirty-three operations were under 10 minutes; 19 ran from 11 to 20 minutes; and 5 extended beyond 20 minutes, the longest being 35 and 39 minutes. If the surgeon anticipates longer operating time, then other more suitable agents are available. He may be assured however that if unexpected difficulties prolong his operation good anæsthesia will still be continued. Operating conditions will probably remain satisfactory, but the dose required will almost certainly be followed by delayed or restless recovery, with the added risk of later organic damage. The effect of pentothal is too transitory to allow of its use as a basal sedative, although nitrous oxide and ether may be safely used with it. This was done deliberately ^{several} times, as in a radical breast amputation, ^{allowing} removal of the tumour, for quick ^{results} with pentothal, or, similarly, hyster-

lowing examination under pentothal. The saving in time in such preliminary examinations is quite remarkable. The introduction of an intratracheal catheter with pentothal alone was quite simple, but the resultant gas anaesthesia was disappointing. Spasm and coughing forced the addition of some ether—not for the introduction of the catheter as is usually stated but for the strengthening of the nitrous-oxide effect throughout the operation. This is an excellent test of the status of intratracheal nitrous oxide without the assistance of ether.

The patients were chosen at random, with no attempt to confine the work to easy cases. Males predominated by 2 to 1, with no appreciable difference. The youngest was 14, with 4 under 20 years. The oldest was 76, with 6 over 60 years. Weight varied from 80 to 220 lbs., with 6 under 110 lbs., and 4 over 190 lbs. There were 29 good risks, and, of these, two-thirds were of the robust, muscular type which are difficult subjects for any form of anaesthesia. Thirty-one patients were classified as ranging from fair to bad, because of the following complications—toxic conditions, carcinoma, diabetes, anaemia, obesity, myocarditis, spinal cord tumour, and lung abscess. No difficulty was encountered in any case except following blockage of the airway by the surgeon or with large doses of morphine. Two developed hiccoughs during operation; although quite violent for two minutes, these cleared up with carbon dioxide. Two complained of some soreness of the arm following leakage of the solution, which is apparently about as irritating, subcutaneously, as glucose. It caused no trouble whatever when confined to the vein. Three showed very slight, generalized, muscular twitching, one during operation and two after. Twitching is generally accepted as a sign of overdosage with any barbiturate. It was very mild compared to that with evipal, where it constitutes the greatest drawback to the use of the drug. One woman had had a fractured jaw wired under 7.5 c.c. evipal, with considerable post-operative excitement and actual convulsions. Three weeks later, with 4.5 c.c. pentothal, the wiring was adjusted easily, with perfect recovery. There was no tremor or nausea. She talked in 15 minutes and was entirely rational in thirty minutes. This bears

out the general impression that pentothal is superior to evipal.

The safety of pentothal lies in the rapidity of its action, so that injection may be continued or stopped, depending on the depth of anaesthesia. Changes occur even more rapidly than with nitrous oxide. To obtain this effect, the drug must be given in fractional doses, the needle being left in the vein and more added from time to time throughout the operation. It is entirely impossible to obtain good anaesthesia by any fixed dose, injected at one time. Contraindications are quite similar to those with avertin or nembutal combined with morphine. As with other respiratory depressants, smaller doses are required in the obese, the cachectic, the toxic, and the patient with poor elimination. General condition is a much greater factor than body weight. Our weights were noted, but the total dose in milligrams per kilo was calculated after the operation was over, for statistical purposes, not as a guide at the time of administration. Our attempt was to arrive at the therapeutic dose in man, as compared to the fatal dose in dogs. In 55 per cent of cases good anaesthesia was obtained with 9 mg. per kilo or less, compared to Waters' fatal dose, in dogs, of 35 mg. per kilo—a ratio of safety of 4 to 1. In all 80 per cent of operations were done with 12 mg. per kilo or less—a ratio of safety of 3 to 1. The remaining 20 per cent represented longer operations in robust patients. Of these, 5 received 18 mg. per kilo ($1\frac{1}{2}$ fatal dose), and 1 actually received 27 mg. per kilo and was talking in 20 minutes and completely rational in less than one hour. Thus very large doses can be tolerated if given in divided amounts. It cannot be too strongly emphasized that these large doses were given fractionally, more drug being added as metabolism proceeded, whereas Waters' fatal dose was, presumably, based on a single injection. To attempt anything like these amounts in one dose would, we believe, be almost certainly disastrous.

The onset of sleep was invariably pleasant, rapid and peaceful. In no instance was there the slightest movement or restlessness. For this reason, all possible preparation of the skin, sterile draping, etc., is carried out before injection commences. The patient counts slowly, until sleep intervenes. In over two-thirds of

our cases drowsiness came on at the count of from 7 to 20, with full natural sleep in 1 minute from the start. This was obtained by injecting 3 c.c. rapidly (in from 7 to 15 seconds), followed by a pause of 45 seconds, during which the patient passed from euphoria to sleep. In this initial sleep there was usually very little change in respiration, colour, pulse or blood pressure, but these signs must be carefully watched as guides to further dosage. Relaxation comes on more slowly than unconsciousness, hence the importance of the pause of at least 45 seconds after the initial 3 c.c. If at the end of 1 minute relaxation is insufficient, another 1 c.c. is given slowly, in 10 seconds, followed by a pause of 20 seconds.

This technique gave complete relaxation in two-thirds of the cases, and allowed incision in one and one-half minutes from the start. In poor risks, the initial injection should not exceed 2 c.c., with a later 1 c.c. for relaxation. This was sufficient in 7 poor types. On the other hand, in about one-third of the cases sleep did not commence until 4 c.c. had been given, and relaxation demanded another 1 or 2 c.c. It is very important to pause for almost one-half minute after each additional 1 c.c., since the cumulative effect may appear suddenly. This method of induction may be accepted as a safe routine, but further dosage will depend entirely on the patient's reaction. Fortunately, relaxation of the jaw goes hand in hand with that of the abdominal muscles. This offers an unusually good guide to the plane of anaesthesia. With satisfactory abdominal relaxation, the jaw is absolutely flaccid and can be moved with one finger without resistance. If this is continually observed, it will be seen that a slight tightening of the jaw occurs 30 to 60 seconds before spasm of the abdominal muscles returns. At the commencement of jaw-tightening the addition of 1 c.c. will deepen the patient so rapidly that the surgeon will not be conscious of any interruption in relaxation in his field. Changes in the eye follow the jaw signs closely, but are not quite so reliable. A widely dilated pupil, with fixed ball, means momentary overdosage. The injection must be stopped and respirations watched, for they will by then have become slow and shallow. With normal abdominal relaxation the ball is fixed or moving slowly, with the pupil moderately

dilated and reacting to light sluggishly. With returning lightness the ball moves widely, the pupil assumes normal size, and reacts to light actively. These signs change very rapidly, dilatation of the pupil occurring in 10 or 20 seconds after an additional 1 c.c., provided no pre-operative sedative has been given. With morphine the eye cannot be depended upon, but the jaw remains a satisfactory guide. Morphine materially increases respiratory depression without giving very much increase in working time. We feel that it should be avoided, as undoubtedly adding to the danger, without giving sufficient increase in relaxation to justifying its use.

Nor does it seem logical to use any other barbiturate before this very potent member of the same group. We believe that it is much safer to give enough of the one drug to get its full effect than to combine a small dose with another depressant. Therefore, if a sedative has been given it must be followed by great care in combating central respiratory depression, notably, by the scrupulous maintenance of a clear airway. This conclusion follows the observation of 39 cases with no sedative and 21 with morphine, gr. 1/4 or 1/6, with atropine. Of the morphine cases two-thirds were entirely satisfactory, but 7 showed undesirable effects: 3 had definite respiratory depression and mild cyanosis, with a drop in blood pressure of 10 to 30 points; 3 others slept for one to one and one-half hours, and were not entirely rational for another hour; the remaining one presented our only alarming reaction. This was a tonsillectomy, where extensive bleeding and manipulation of the mouth gag shut off the airway, with momentary stoppage of breathing. Restoration of the airway allowed easy completion of a difficult operation. In contrast, 2 other mouth operations, without morphine, showed similar obstruction with no particular trouble. Despite the respiratory difficulty, the pulse remained excellent, showing relatively little effect on the heart, except secondarily through anoxæmia. The use of oxygen and carbon dioxide, therefore, would seem to be the method of choice in combating overdosage and should prevent any fatality. Coramine, 5 c.c. intravenously, was given four times in an endeavour to hasten awakening. It had no spectacular effect, but is undoubtedly the best drug to com-

bine with oxygen, should dangerous depression arise. In half the non-morphine cases the colour, respiration, and pulse showed little change, and the blood pressure actually rose from 5 to 15 points. The other half showed mild depression, about equal to that with combined morphine and nembutal, with a drop in blood pressure of 10 to 20 points. Two cases of myocarditis reacted excellently.

Recovery is one of the outstanding features of pentothal. It is not so rapid as after nitrous oxide but more pleasant. Almost invariably, there is a period of euphoria not seen with inhalation anaesthetics. Most noteworthy is the absence of vomiting, which occurred in only 2 cases. Both patients had eaten just previously. In 11 cases anaesthesia followed a full meal, and in several water or tea was given immediately on awakening without the slightest nausea. In this it resembles evipal in surpassing any inhalation anaesthetic for safety, with a full stomach. If undisturbed, the well-behaved patient lies as in natural sleep, and in about 15 minutes from the end of operation opens his eyes, moves around quietly, and gradually orients himself, taking another 15 or 20 minutes to become fully rational. One-half of our patients could be left unattended with perfect safety in less than 30 minutes from the end of operation. Following recovery to this stage, however, there is a period of ataxia or incoordination lasting for 1 to 2 hours. He is absolutely normal in bed, but on attempting to walk may be dizzy, with drunken reeling. An ambulatory patient should remain lying down for at least 2 hours from the time he is fully rational. Eight walked home alone in two to three and one-half hours, but could have gone sooner, had they been accompanied. It is therefore hardly an office procedure but is very satisfactory in the home since the patient can be left in a few minutes. This type of normal recovery was found in 90 per cent of cases, after eliminating 7 which were purposely combined with gas and ether. Recovery of these combined cases was apparently unaffected by the drug. Of the 53 straight pentothal anaesthetics, 48 showed normal recovery, in whom 4 answered questions in 3 minutes, 32 in 10 to 20 minutes, and 12 not until 25 to 40 minutes. All in this group were rational in less than 1 hour from the end of the operation—7 being rational

in 10 minutes, 23 in 20 to 30 minutes, and 18 in 25 to 60 minutes. Only 5 showed any deviation from this normal, and these were about equal to the average ether recovery in the same type of patient and operation. These all followed large doses—11 to 18 mg. per kilo, given for from 12 to 26 minutes. Two of these particular patients were noisy and cried out for 20 minutes and 2 hours, respectively, but were fully rational in 1 and 3 hours; 3 others tossed around in bed, moaned and muttered incoherently for 20 to 60 minutes. They were entirely safe but required watching (without restraint, however) until rational in 1½ to 2 hours.

This picture is highly satisfactory, but the problem of the future lies in the possibility of delayed toxicity affecting the liver, kidney, heart, etc. This point can be determined only after repeated animal experiments or clinical observations, under conditions of diet and exercise more rigidly controlled than was possible in our work. Blood chemistry was undertaken in 13 patients, including most of those with large doses or abnormal recovery. The results point to little systemic damage under practical working conditions. Five patients received multiple doses, the second being given from 3 to 26 days after the first, without evidence of cumulative toxicity. Blood sugar is apparently not affected; 17 post-operative readings showed no significant change. There were 2 diabetics, one with a pre-operative blood sugar of 0.218 per cent; with insulin the course was excellent. The possibility of such massive doses of a barbiturate precipitating agranulocytic angina was considered, although it is now quite widely admitted that barbiturates are not the cause. Certainly, there was no evidence of such action in 10 cases, checked at from 2 to 30 days; the white cell and differential counts remained satisfactory, as compared to a leucopenia and relative lymphocytosis to be expected with this obscure blood disease. No liver function tests could be obtained, although the companion drug, evipal, is metabolized in the liver without damage. The very important question of kidney damage was investigated by estimation of the urea-nitrogen content of the blood. Nineteen readings were taken, at from 1 to 12 days (the majority at 1 to 2 days). All remained within normal limits. Eleven were entirely

normal (under 15 mg. per 100 c.c.), and 8 were high normals (16 to 19.6 mg.). In 3 cases the 48-hour test was 2 to 3 mg. higher than the 24-hour reading, although still within the range of normal metabolism or laboratory error. Practically all bed patients had pre- and post-operative urinalyses. Only 1 (aged 76) showed a trace of albumin, and her blood remained normal. One, with definite pre-operative albumin, showed none after 2 large doses (18 mg.) 3 days apart. This seems to point to any kidney damage being transient and probably unimportant. Possible exception to this conclusion depends on the significance which may be attached to our only questionable reaction. High fever and generalized oedema followed the use of 5 c.c. (10 mg. per kilo) for the introduction of an intratracheal catheter as a preliminary to intratracheal nitrous oxide-ether anaesthesia for 2 hours. It was entirely a question of late kidney damage, there being no suggestion of too deep a sedative action. The surgical service disclaimed responsibility and attributed her condition to an acute nephritis due to pentothal. Extenuating circumstances were, a relatively large intake of fluids, intravenously and by mouth (ranging from 3,700 c.c. to 6,000 c.c. daily for 5 days), and the development of infection in the wound. Medical consultants were of the opinion that it was a matter of excessive intake rather than defective output. A reasonable explanation is that

the initial temperature followed mild pulmonary changes, undetectable clinically, and that, as the wound infection gained headway, this became the active factor in the fever. To combat this temperature intravenous infusion was increased, apparently beyond the limit of the patient's tolerance. Subsequent progress was satisfactory, and we believe that the above explanation would have been accepted had a more orthodox anaesthetic been used. Of course, if similar reactions are reported by others we shall be forced to change our interpretation of these symptoms, but until then we are loathe to abandon pentothal on the basis of one case, surrounded by such an element of doubt.

To a number of ingenious devices, designed to facilitate fractional injection, we add the one illustrated. The only claim to originality lies in the manner in which several well known pieces of apparatus have been combined and adapted from their original use. Manipulation of a three-way valve allows a steady flow of saline, to prevent blockage of the needle, with intermittent additions of the anaesthetic solution in accurately measured amounts as needed. There is a trough-shaped, metal arm rest, 20 inches long, in which the arm lies naturally. It is fixed rigidly, but comfortably, by wide elastic bands at each end. Perforations in each band allow it to be hooked over projecting studs on the arm rest, giving the correct tension to prevent flexion or rotation. At the distal end of the arm rest is a socket, into which fits tightly a metal pillar, 15 inches high (such a socket is provided at each corner of the arm rest to accommodate this pillar in any type of working position). To the pillar are attached, by spring clips, 2 Luer syringes: 20 c.c. for saline and 10 c.c. for anaesthetic. Each upright syringe is joined by short rubber tubing to one arm of a three-way stop-cock, which is rigidly mounted on the face of the pillar between the

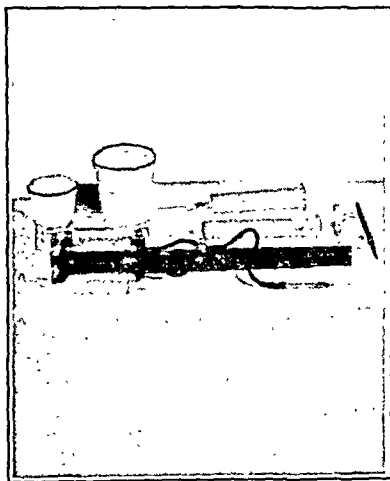


Fig. 1

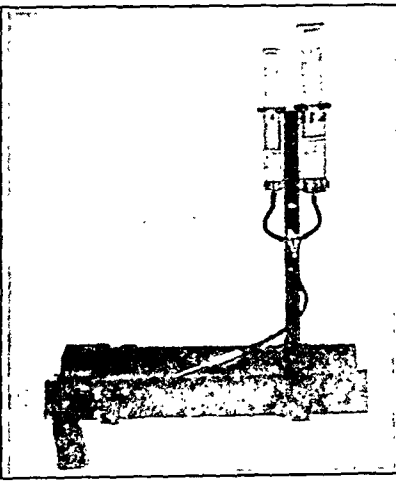


Fig. 2

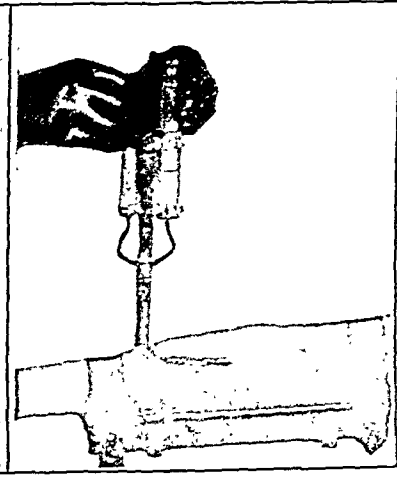


Fig. 3

Fig. 1.—Sterile preparation tray; pillar, syringes and tubing sterilized as a unit; cups for water and saline; syringe and needle for preparation of solution and withdrawal of blood; ampoule of pentothal powder and file. Fig. 2.—Apparatus assembled; spare sockets at each corner of arm rest allow location of syringes in most convenient position. Fig. 3.—Apparatus in use, on arm board without interference with surgeon; adjustable straps hold arm rigid; manipulation of syringes causes no movement of needle.

syringes and a few inches above the arm. The third outlet of the valve bears 6 inches of thin gum rubber tubing attached to a glass adapter, ground to fit the intravenous needle. For sterilizing, the pillar and attached syringes, tubing and stop-cock are boiled after being assembled, the plungers only being boiled separately. The whole injecting system is therefore sterile and ready for use when added to the arm rest. The complete apparatus is a single unit, and so solid that injection may be made with the arm at the patient's side extended on an arm board or steadied on the anaesthetist's knee. Even violent movement will not dislodge the needle: he may lift or turn the arm at any angle, but with it will go the needle and syringes, in the same relative position. With a little practice, it becomes quite easy to sit at the head, holding the chin with one hand and operating the valve and syringes with the other. Unfortunately the lower 6-inch tube holds approximately 1 c.c., and this presents a difficulty in manipulation which it has been impossible to overcome. It is necessary to inject 1 c.c. of anaesthetic, followed by 1 c.c. of saline to clear the tube: then 1 c.c. of anaesthetic, again cleared by saline, always stopping administration with saline in the tube, so that more saline may be kept running through the needle from time to time until more drug is

needed. Either syringe may be refilled at any time without interfering with the needle, by disconnecting the short tube at the stop-cock, dipping the free end into the ampoule or cup of saline, and drawing the desired amount into the syringe. Contamination must be guarded against by the liberal use of alcohol on the fingers and tubing. The apparatus as shown is the result of repeated changes, dictated by trial and error. Each part has been selected and placed after rejection of alternative arrangements. In its present form it is quite satisfactory and may be duplicated in any amateur work-shop at small expense. It is doubtful if some of our longer operations could have been completed without the use of some such mechanism.

REFERENCES

1. HEARD, K. M.: Clinical observations on the use of evipan, *Canad. M. Ass. J.*, 1934, 31: 617.
2. LUNDY, J. S.: Preliminary report of the use of two new thiobarbiturates, *Proc. Staff Meetings, Mayo Clinic*, 1935, 10: 536.
3. HALE, D. E.: Intravenous anaesthesia, *Proc. Staff Meetings, Mayo Clinic*, 1935, 10: 743.
4. WATERS, R. M.: A preliminary experimental and clinical study of sodium ethyl (1-methyl butyl) thiobarbiturate. Unpublished communication to the manufacturers.

CRYPTOMYCES PLEOMORPHA HAS NO ETIOLOGICAL RELATION TO CARCINOMA

BY PAULINE BEREGOFF-GILLOW, PH.G., N.S., M.D.,*

Montreal

IN the January, 1935, issue of this *Journal*, Dr. O. C. Gruner¹ described a very interesting microorganism of the ascomycetes order and named it *Cryptomyces pleomorpha*. Owing to the fact that the organism was isolated from the blood and malignant tissue of a patient suffering from general carcinomatosis, and because it appeared to be unlike other members of the ascomycetes, differing in pleomorphism and cultural characteristics, the question arose as to its etiological relation to malignant disease. For this reason I undertook further experiments to prove or disprove such a relationship.

MATERIAL

1. Bloods of 50 cancer patients. Three samples were taken from each patient in 3 successive days at varying hours.
2. Forty-five specimens of malignant tissue, obtained immediately after the removal of the growth.
3. Animals—80 rats derived from two families; 20 mice, all from the same family. All

animals were bred in the laboratory, and experimental work with other animals of the same families proved their susceptibility to tumour growth after transplantation of tumour tissue.

TECHNIQUE

1. Ten c.c. of blood were obtained from each patient by venepuncture under the most aseptic conditions. We transferred this blood to three flasks, each containing 20 c.c. of Gruner's asparagus broth medium. One flask was placed in the incubator at 37.5° C.; one was kept at room temperature; and the third was cultured anaerobically by the pyrogallie method at a temperature of 37° C. This process was repeated on three successive days at varying times. The cultures were examined and replanted every 48 hours for 8 weeks under rigid aseptic conditions, to prevent contamination. Gruner's asparagus agar medium was used for the replanting.

2. Each fragment of tumour tissue of each patient was cut aseptically into three parts, each of which was placed in a culture flask containing 15 c.c. of asparagus broth, and cultured in the same manner as was the blood.

3. Inoculation of animals.—

* Formerly Director of Experimental Medicine and Professor of Pathology and Parasitology of the University of Cartagena, Colombia; also Ex-fellow in Cancer Research of the New York City Cancer Institute.

Group I.—Rats—15 males and 15 females, ranging in age from 4 to 5 months, were inoculated as follows: 3 pairs intrapleurally; 5 pairs subcutaneously, in either the inguinal or axillary area; 2 pairs intraperitoneally; 5 females in the breast tissue; 5 males in the testicle. For this group we used for the inoculation a 24 to 48 hour culture of *Cryptomyces pleomorpha*.² Dose 0.5 c.c.

Group II.—Rats—15 males and 15 females, ranging in age from 8 to 9 months, were divided and inoculated as in group 1, excepting that the dosage was 1 c.c.

Group III.—Rats—20 males and 20 females, ranging in age from 11 to 12 months, were divided and inoculated as in the preceding groups, but with the addition of 5 females which were inoculated in the breast and 5 males in the testicle. For this group we used 1 c.c. of a 12-day culture.

Group IV.—Mice—10 males and 10 females, ranging in age from 6 to 7 months, were divided and inoculated as follows: 2 pairs subcutaneously, 2 pairs intraperitoneally, 6 females in the breast tissue, 6 males in the testicle. The dosage was 0.5 c.c. of a 48 to 60 hour culture.

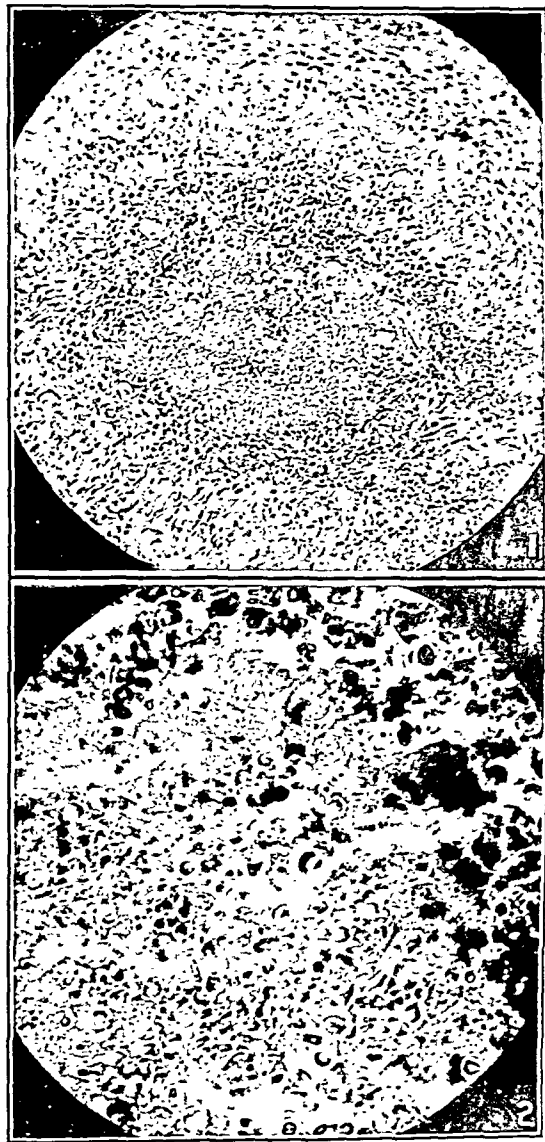
RESULTS

1. All the blood cultures remained sterile except for two which were contaminated with *B. subtilis*.

2. All the tissue cultures remained sterile except for 3 which showed a Gram-positive bacillus having the characteristic morphology of the diptheroid group.

3. Animal observation over a period of 14 months showed the following points. Of those inoculated intrapleurally 2 died within 48 hours after inoculation. Smears of the blood and organs showed the megaspores with very refractive capsules. The lungs showed a pneumonic process. Of the 30 animals that were inoculated either intrapleurally or intraperitoneally, 20 died of general infection. The lungs of those inoculated intrapleurally and the livers of those inoculated intraperitoneally showed scattered abscesses. Some of the organs showed indurated areas, microscopic sections of which presented the arrangement of typical tubercles (Fig. 1). In the central necrotic area many refractive megaspores were noted (Fig. 2) and an occasional giant cell. The infiltration was predominantly monocytic.

Of those animals that were inoculated in the breast tissue, intratesticularly or subcutaneously, some presented indurated areas at the point of inoculation and some showed abscesses the pus of which contained the fungus. Within six weeks, however, there was complete absorption, with very faint scar formation, i.e., complete recovery. The mice presented the



same lesions as the rats. A progeny of a mouse that was inoculated in the breast tissue was perfectly normal and still living at the age of 9 months. The progeny of a Group II rat which was inoculated intraperitoneally died within 2 to 4 weeks after birth. The organism was isolated from the blood and every organ. Nine progenies derived from the rats that were inoculated either subcutaneously or in the

breast tissue showed no evidence of the disease.

Twelve months after inoculation, 35 animals of the various groups were sacrificed. Every organ was found to be in normal condition. The remaining animals are alive and well after 14 months' observation. The numerous sections taken from the animals that died, including those of the progeny, and those taken from the indurated areas of the animals inoculated subcutaneously, as well as those sections taken from the animals that we sacrificed, showed *no evidence of malignant infiltration*.

DISCUSSION

It appears that the finding of this microorganism in the original case was a mere coincidence. There are a large number of cases reported in the literature in which different fungi have been isolated from cancer lesions. I recall one very interesting case which came to my observation in a European clinic. The patient suffered from an unsuspected carcinoma of the lung. During an excess of coughing she expelled a thick sputum which contained yellowish granules resembling those of actinomyces. Microscopic examinations as well as cultures confirmed this. The patient died several days later, and the post-mortem revealed a primary malignant growth of the lung, replacing practically an entire lobe. Around this growth there were scattered abscesses which contained the fungus of actinomyces. No one could say with certainty

which disease was primary, although in this case we supposed the mycotic infection to be the first, due to the fact that the patient lived on a farm and attended to cattle. If our supposition is correct, the fungus served as an irritating factor in a constitution already predisposed to malignant proliferation, for in this case there was a definite family tendency to cancer, the patient's mother having died of cancer of the breast and her brother of cancer of the throat.

So far there is no evidence to support the belief that any of the many parasites or bacteria found in tumour tissues are capable of producing the disease, except as remote factors.

CONCLUSION

Repeated cultures of the blood and malignant tissues of cancer patients failed to show any growth of the Gruner organism.

One hundred animals inoculated in different areas, and observed for a period of 14 months, failed to give any evidence of malignant proliferation.

The bloods and tissues were obtained from the Montreal General Hospital (Dr. Bazin and Dr. Barlow); Royal Victoria Hospital (Dr. Ballon and Dr. Archibald); The Woman's General Hospital (Dr. Bercowitz), to all of whom I am greatly indebted.

REFERENCES

1. GRUNER, O. C.: *Cryptomyces pleomorpha*; a new organism isolated from the blood of a case of metastasized carcinoma of the breast, *Canad. M. Ass. J.*, 1935, 32: 15.
2. Obtained from Dr. Gruner, to whom I am indebted.

THYROIDECTOMY FOR ANGINA PECTORIS: CASE OF ANGINA PECTORIS ASSOCIATED WITH NON-TOXIC GOITRE RELIEVED BY TOTAL ABLATION OF LEFT LOBE OF THYROID GLAND.—In the light of recent information on relief of angina pectoris following thyroidectomy Bisgard attempts to analyze the mechanism of relief in his patient who presented an unusual clinical picture of angina pectoris associated with an old substernal degenerated adenomatous goitre and with a hypometabolic state without symptoms of myxœdema. In consideration of a pre-operative metabolic rate of minus 32 (decidedly inaccurate), it seemed unwise to deprive the patient totally of thyroid tissue, and since the pain had always been confined to the left side it seemed probable in the light of the experience of Lyon and Horgan that it might be relieved by subtotal thyroidectomy, the left lobe, however, being removed completely. This procedure gave not only immediate but also prolonged (now eleven months) relief from angina pectoris, and the relief developed not as a result of hypothyroidism but rather in the presence of sufficient thyroid tissue to maintain a normal metabolic rate. No determinations were made of the rate of blood flow before or after operation, but if the metabolic rate is an index to the rate of flow, it is reasonable to assume that the velocity was increased rather than decreased. Disregarding this speculation, the fact remains that there has been prolonged relief in the presence of a normal metabolic rate and that a reduction in the metabolic demands on the heart has played no

part. Interruption of the sympathetic nervous innervation of the left lobe of the gland obviously was accomplished at operation, and if this represents the mechanism of relief in this case it differs from that observed by Weinstein and his associates for abnormal sensory manifestations and attacks of angina pectoris did not return in a few weeks and have not recurred to date. Only by virtue that there exists direct nervous communication between the heart and the thyroid independent of the sympathetic or other nerve trunks and that these pass from the heart upward in the adventitia of the aorta, innominate carotid, and superior and inferior thyroid arteries can the author explain the prolonged relief of angina pectoris in his case and in the cases reported by Lyon and Horgan. No studies of sensitivity to epinephrine were made in his case. However, since there was at all times sufficient circulating thyroid secretion to maintain a normal metabolic rate, the theory of relief of angina pectoris from a reduction of sensitivity to epinephrine, as advocated by Levine, Cutler and their associates, seems inapplicable. It is probable that some change did occur in the interrelationship of the thyroid and adrenals, and equally probable in the interrelationship of all members in the endocrine system. In support of this contention are the changes that occurred after operation in the metabolic rate (an elevation from minus 30 per cent to minus 5 per cent) and in the metabolism of sugar, which shifted from pre-operative abnormality to post-operative normality.—*J. Am. M. Ass.*, 1936, 106: 1639.

EFFECTS OF BETAINE UPON THE CHOLESTEROL AND BILIRUBIN CONTENTS
OF BLOOD PLASMA IN DIABETES MELLITUS*

BY I. M. RABINOWITCH,

Montreal

BEST and his co-workers in Toronto have shown that deposits of fat in animal livers caused by feeding of either fat or cholesterol may be made to disappear by the administration of choline. These workers have also shown that choline is not only curative but can prevent this deposition of fat. In the interpretation of such experiments, however, consideration must be given to a variety of modifying factors. Composition of diet, for example, is a factor. Casein was found to exert a lipotropic action; with diets of constant protein content the degree of fatty infiltration was found to vary with the fat content of the diets; and with diets of constant fat content the degree of fatty infiltration was found, in general, to vary inversely with the casein intake. (Different proteins have different lipotropic values. Gelatine, for example, has none). Pure sucrose caused an increase of fat, whereas the addition of protein prevented this excess deposition. Dried yeast and certain yeast preparations used for their contents of vitamin B₁ were found to be lipotropic, and on analysis were found to contain choline; "marmite" contained as much as 3 mg. per gram. Initial height of the glyceride content of the liver is to some extent another variable. A brief summary of the experiences of these authors will be found in a recent communication by Best and Channon.¹

A study of any large group of diabetics shows that people suffering from this condition are no less liable to diseases of the liver (cirrhosis, malignancy, infection, etc.) than non-diabetics. Disease of the liver, secondary to disease of the gall bladder, is perhaps more common in the diabetic than in the non-diabetic. This is suggested from the finding, both in Joslin's clinic and in our own, that about one adult in every four had some disease of the gallbladder. Hæmochromatosis is definitely more common amongst diabetics than non-diabetics. Here, as is well known, the

diabetes is, as a rule, a secondary and terminal manifestation. Aside from these conditions, however, there is much to suggest that there is a causal, as well as an accidental, relationship between disease of the liver and diabetes, as the following observations show.

Enlargement of the liver is common amongst juvenile diabetics. Priscilla White² found palpable livers in 40 per cent of her cases, and, in one case, the enlargement was such that the lower border was found in the pelvis.³ That such enlargement is due essentially to fatty infiltration is suggested from the writer's experiences with a similar case.

A girl, 17½ years old, a diabetic of 7½ years' duration and a patient in this clinic since 1929, was admitted to the hospital into the service of Dr. C. P. Howard on February 4, 1935, in coma. The liver edge was then found 19 cm. below the costal margin in the mid-clavicular line. She recovered fully from the coma, and the subsequent course was uneventful, except for the rapid recession of the edge of the liver, which was at the costal margin when she was discharged from the hospital on February 25th, 21 days after admission. She was re-admitted about three months later (May 29th) again with severe acidosis, but not in coma, and, at this time, the liver edge was found 23 cm. below the costal margin in the mid-clavicular line. Again, following control of the diabetes, the liver edge receded rapidly, and when she was discharged from the hospital on August 5th it was at the costal margin. She was re-admitted to the hospital nine days later (August 14th), and the liver edge was then found 10 cm. below the costal margin. With treatment, it again receded and was at the costal margin on her discharge from the hospital on August 26th. When she returned to the Out-door Clinic for Diabetes on September 10th, the liver edge was again found 10 cm. below the costal margin.

It is of interest here to note that fatty infiltration of the liver is readily produced in the completely depancreatized animal, and, as Best *et al.*⁴ have shown, the condition is greatly exaggerated, in spite of insulin therapy, when the choline content of the diet is kept low. Fatty infiltration of the liver is also a common post-mortem finding in the human diabetic in death due to diabetic coma. In fact, reference to fatty infiltration is one of the oldest observations on the pathology of diabetes: Mead⁵ first drew attention to it in 1784.

In 1926, the writer⁶ drew attention to the

* From the Department of Metabolism, the Montreal General Hospital, Montreal.

high incidence of excess quantities of bilirubin in the blood of diabetics; of a group of 130 cases hyperbilirubinemia was found in 30—an incidence of 26.1 per cent. Since then determination of the bilirubin content of the blood has been a routine test in this clinic; and in a later investigation of a much larger group of cases (500) by Dr. A. C. Corcoran the incidence of hyperbilirubinemia was practically the same. In a more recent investigation, which included 3,000 analyses, the incidence of hyperbilirubinemia—more than 0.5 units—was found to be 27.4 per cent. This is shown in the following Table which is a brief summary of a more extensive Table of another report.⁷

<i>Units of bilirubin (range)</i>	<i>Number</i>	<i>Percentage</i>
- 0.5	2,178	72.6
0.6-1.0	699	23.3
1.1-1.5	76	2.5
1.6-2.0	19	0.63
2.1-	28	0.93

Assuming that, in the absence of biliary obstruction and hæmolysis, excess quantities of bilirubin in the blood are due to hepatitis, these data afford further proof of the high incidence of impairment of liver function in diabetes mellitus.

Further suggestive of an intimate relationship between liver function and carbohydrate tolerance in diabetes are the experiences with diets. Himsworth,⁸ by well controlled experiments, has clearly demonstrated that diets rich in fat depress, whereas, diets rich in carbohydrates improve, carbohydrate tolerance; and that diets rich in fats decrease, whereas, diets rich in carbohydrates increase, the sensitivity of the individual (animal or man) to insulin. From the observations of Himsworth it would appear that the explanation of these phenomena is to be found in the liver; but, perhaps, the most impressive evidence of the importance of the liver in the control of diabetes is the finding of Soskin, Allweiss and Cohen.⁹ These authors have shown that if the blood sugar is kept at the normal level by administration of insulin it is possible to obtain perfectly normal blood sugar time curves in the completely depancreatized animal, *providing the liver is not disturbed*.

In view of the above observations, an attempt was made to determine the value of one of the

derivatives of choline—betaine—in a group of diabetics who failed to respond to treatment in the usually expected manner with our high carbohydrate-low calorie diet.

As has been shown repeatedly by the writer, the high carbohydrate-low calorie diet which has been in use in this clinic for more than six years¹⁰ leads, in the majority of cases, to marked improvement of carbohydrate tolerance,¹¹ and the experiences, in general, fit in with the above-mentioned observations of Himsworth. Like all other diets used in the treatment of diabetes, however, this diet has its failures. A careful study of these failures showed that, in the majority of cases, treatment had little or no effect upon the cholesterol content of the blood, whereas, as the writer has shown repeatedly¹² one of the most striking characteristics of the high carbohydrate-low calorie diet is an immediate and sustained decrease of plasma cholesterol. With this diet, also, as with the older methods of treatment,¹³ it has been noted that the patients whose blood cholesterol were not normal have not done as well as those whose bloods contained normal quantities of cholesterol. Minor dietary indiscretions resulted in more prolonged hyperglycemia; the insulin dosages were higher; and mild infections (colds, etc.) were more common and led to more prolonged hyperglycemia than with similar conditions, but with normal amounts of cholesterol in the blood. Digestive disturbances commonly met with in the past with the high fat diets have also been noted with the new diet when the bloods contained excess quantities of cholesterol. Of particular interest here is the fact that in the majority of these failures the bloods not only contained excess quantities of cholesterol but also of bilirubin. The possibility, therefore, occurred to the writer that in these cases *constant exposure to excess quantities of cholesterol in the blood may have the same effects upon the liver in the human being as those which were found by Best and his co-workers in animals after feeding of cholesterol*.^{*}

An obvious difficulty in putting this idea to the test of experiment is that, unlike in animal

^{*} Both Dr. L. J. Rhea and Dr. J. E. Pritchard, our pathologists, have been impressed with the fact that more recently at autopsies of diabetics they have not found the fatty livers which were common prior to the use of the high carbohydrate diet. Of interest here is also the report of a case of typhoid fever in a child of 8 years with marked enlargement of the liver due to excess cholesterol esters.¹⁴

experiments, the effects of cholesterol upon the liver cannot be determined directly; measurement of the size of the liver is of little or no value, since anatomical integrity and functional efficiency are not necessarily, and as a rule are not, synonymous. The only other evidence, clinically, are the results of tests of liver function and, as yet, these are not very satisfactory. Bollman and Mann¹⁵ have shown that when liver tissue is reduced in animals by repeated lobectomy the first indication of liver failure is accumulation of uric acid in the blood. From other data it would also appear that uric acid is dealt with exclusively by the liver. Theoretically, therefore, it would appear that the effects of betaine feeding would best be observed by analysis of this blood constituent. Actually, however, from our own experiences with many thousands of tests, we have found the estimation of uric acid a very unsatisfactory test of liver function. The reserve capacity of the liver,¹⁶ its ability to regenerate,^{17, 18} and the fact that failure of one function does not necessarily imply failure of another, are some of the difficulties in the interpretation of data. This applies also to all of the other tests of liver function (galactose, l  vulose, the phthalein tests, etc.). From our own experiences, at least, the van den Bergh reaction appears to be the most satisfactory qualitative index of early impairment of liver function. In this study, therefore, the effects of betaine feeding were measured by determination of the bilirubin content of the blood. The cases which were selected for this study included only those whose bloods not only contained excess quantities of cholesterol but also excess quantities of bilirubin.

In this report are recorded the experiences with ten diabetics, each of whom had been under observation for at least one year before and at least one year after treatment with betaine. No cases are included in which there were less than ten determinations of cholesterol and ten of bilirubin both before and after treatment. The betaine used was obtained from the Research Laboratories of the Eastman Kodak Company, Rochester, N.Y. (betaine hydrochloride—P. 345). In each case, the dosage was 0.5 gram, three times a day. No disturbing effects were noted with the drug at any time. The combined data are shown in the accompanying Table.

EFFECTS OF BETAINE FEEDING UPON CHOLESTEROL AND BILIRUBIN CONTENTS OF BLOOD PLASMA IN TEN CASES OF DIABETES MELLITUS

Cholesterol
(mgms. per 100 c.c.)

Remarks	Period*	
	Before†	After†
Number of analyses	113	166
Cholesterol: maximum	432	299
minimum	151	161
average	258	244
σ	122	118
PE(m)	7.71	6.13
PE Δ	9.8	
$\frac{\Delta}{PE\Delta}$	1.4	

Bilirubin
(Units)

Remarks	Period*	
	Before†	After†
Number of analyses	113	178
Bilirubin (units) maximum	2.4	2.5
minimum	0.2	0.2
average	0.86	0.49
σ	0.28	0.32
PE(m)	1.77	1.61
PE Δ	2.4	
$\frac{\Delta}{PE\Delta}$	15.0	

*Cases under observation for less than one year are not included.

†Cases with less than ten blood analyses in each period are not included.

σ = Standard Deviation.

PE(m) = Probable Error of Mean.

PE Δ = Probable Error of Difference between Means.

Δ = Ratio of Difference between Means to Probable Error of Difference.

PE Δ =

In order to simplify demonstration of the Ratio in the cases of bilirubin, the number of units is multiplied by 100.

It will be observed that the average concentration of cholesterol in the blood plasma after administration of the betaine was slightly less than that noted during the control period. However, when these average values are judged by their probable errors it is obvious that the difference found is of little or no significance, since the ratio of the difference to its probable error was 1.4 only. This does not, however, necessarily imply that the betaine was inert. In the interpretation of these data consideration must be given to the fact that the cholesterol content of the blood may not be a proper

index of the degree of deposition of fat in the liver. It should here be observed that when fatty infiltration of the liver was produced by Best and his co-workers in their diabetic dogs the condition was not reflected in the blood; there was no increase of blood fat. Another important observation of these authors was that though the choline administered led to disappearance of fat from the fatty livers, regardless of the method of their production (cholesterol or fat feeding) it did not have the same effect upon the cholesterol esters as upon the other lipoids. (This result was due in part to the large amount of cholesterol fed [1 to 2 per cent of diet]. Using 0.2 per cent, the effect of choline on the esters is much more marked.)*

That the betaine was not inert in the above-mentioned diabetics is suggested from its effects upon the bilirubin contents of the blood. It will be observed that in the 113 tests during the control period the average amount of bilirubin in the blood was 0.86 units, whereas, after administration of the betaine it was 0.49 units—a reduction of approximately 57 per cent. That the difference noted was significant is clearly shown by the ratio of the difference to its probable error $\frac{\Delta}{PE\Delta} = 15.0$. These data, therefore, justify the conclusion that the feeding of betaine in these cases resulted in improvement of liver function, at least so far as the metabolism of bilirubin is concerned. This conclusion is, of course, statistical. It, therefore, may, or may not, and need not necessarily, apply to an individual.†

From the combined data the writer has the impression that there has also been some improvement of carbohydrate tolerance, judging from the increase of carbohydrates and reduction of insulin dosages; and that the improvement paralleled improvement of liver function, judging from the reduction of the bilirubin contents of the blood. However, an impression is not proof and a much longer period of observation will be necessary, in view of the gain of carbohydrate tolerance generally noted with

the high carbohydrate-low calorie diet.¹¹ The data are, however, very suggestive, in view of the fact that these cases were selected for this study because they were regarded as failures in their response to treatment.

It is of interest here to note that the average protein content of the high carbohydrate-low calorie diet is appreciably higher than that of the older diets of much higher fat and much lower carbohydrate contents. An interesting speculation, therefore, is whether, aside from carbohydrates improving and fats depressing carbohydrate tolerance, as shown by Hims-worth, some of the improvement noted with this diet may not be due to its protein content, in view of the observation by Best and his co-workers that some dietary proteins contain an effective lipotropic factor. Should this be found to be so, it is obvious that, in the future, in the construction of diabetic diets consideration will have to be given not only, as in the past, to carbohydrates, fat, protein, etc., but, also, to the content of choline and its derivatives. The definitely proved harmful effects of cholesterol, and the tendency of certain fats to cause fatty infiltration more readily than others, may also have to be considered. Best (personal communication) for example, has found that beef dripping was more effective in producing fatty livers than butter. The experiences reported here, therefore, certainly warrant further investigation of the effects of betaine in human diabetes, especially in view of the fact that no harm was observed with the betaine, and that, compared with the dosage of choline which were used in the experimental animal, the amounts of betaine used in the above-mentioned cases were small.

This work was done with the aid of a grant from Mr. Julian C. Smith, of Montreal, and a Governor of this hospital.

REFERENCES

1. BEST, C. H. AND CHANNON, H. J.: The action of choline and other substances in the prevention and cure of fatty livers, *Biochem. J.*, 1935, 29: 2651.
2. WHITE, P.: Fat and the diabetic, *New Eng. J. Med.*, 1933, 209: 519. Quoted by E. P. Joslin.
3. WHITE, P.: Diabetes in Childhood and Adolescence, Lea & Febiger, Phila., 1932.
4. BEST, C. H., FERGUSON, G. C. AND HERSHEY, J. M.: Choline and liver fat in diabetic dogs, *J. Physiol.*, 1933, 79: 94.
5. MEAD, R.: Cited by Shields Warren, The Pathology of Diabetes Mellitus, Lea & Febiger, Phila., 1930.
6. RABINOWITCH, I. M.: The van den Bergh reaction in diabetes mellitus, *Brit. J. Exp. Path.*, 1926, 7: 155.
7. RABINOWITCH, I. M.: A note on the bilirubin content of blood and urobilinogen content of urine in diabetes mellitus, *Brit. J. Exp. Path.* (In press).
8. HIMSWORTH, H. P.: Dietetic factors influencing the glucose tolerance and the activity of insulin, *J. Physiol.*, 1934, 81: 29.
Idem, High carbohydrate diets and insulin efficiency, *Brit. M. J.*, 1934, 2: 57.

* Personal communication.

† It is of interest here to note that in their early experiments with fatty livers in animals, produced by feeding of fat and cholesterol, Best and his co-workers found large amounts of bile pigment in the urines, which disappeared after administration of choline. No tests were made of the bilirubin contents of blood. (Personal communication).

9. SOSKIN, S., ALLWEISS, M. D. AND COHEN, D. J.: Influence of the pancreas and the liver upon the dextrose tolerance curve, *Am. J. Physiol.*, 1934, 109: 155.
10. RABINOWITCH, I. M.: Experiences with a high carbohydrate-low calorie diet for the treatment of diabetes mellitus, *Canad. M. Ass. J.*, 1930, 23: 489.
11. RABINOWITCH, I. M.: Effects of the high carbohydrate-low calorie diet upon carbohydrate tolerance in diabetes mellitus, *Canad. M. Ass. J.*, 1935, 33: 136.
12. RABINOWITCH, I. M.: Arteriosclerosis in diabetes, *Ann. Int. Med.*, 1935, 8: 1436.
13. RABINOWITCH, I. M.: Cholesterol content of blood plasma in diabetes mellitus, *Arch. Int. Med.*, 1929, 43: 363.
14. BEUMER, H.: Fatty degeneration by excess of cholesterol ester in case of acute yellow atrophy of the liver caused by typhoid, *Jahrb. f. Kinder.*, 1935, 145: 265.
15. BOLLMAN, J. L. AND MANN, F. C.: Liver function tests, *Arch. Path. & Lab. Med.*, 1926, 1: 681.
16. BOLLMAN, J. L. AND MANN, F. C.: Hepatic function in relation to hepatic pathology, *Ann. Int. Med.*, 1934, 8: 432.
17. FISHBACK, F. C.: A morphologic study of regeneration of the liver after partial removal, *Arch. Path.*, 1929, 7: 955.
18. HIGGINS, G. M. AND ANDERSON, R. M.: Experimental pathology of the liver, *Arch. Path.*, 1931, 12: 186.

THE UNSTABLE COLON*

By C. J. TIDMARSH, M.A., M.D., F.R.C.P.(C.),

Montreal

IT is an interesting but none the less regrettable fact that the medical profession generally does not regard purely functional disorders as worthy of serious attention. For centuries, the profession has been trained to believe that the smallest departure from normal function must be due to some objective pathological change which needs only a sufficient number of clinical and laboratory tests to demonstrate its presence. This tradition has become deeply entrenched in our medical teaching. The colon has suffered more than its share as a result of this medical apathy. We are content for the most part to accept the patient's diagnosis of chronic constipation, prescribe a high roughage diet with some moderately irritating laxative, and hope that the next time the patient comes he will have some really interesting complaints.

Within recent years, however, our knowledge of the physiology of the colon has increased materially. We know that this organ *has* useful functions to perform, if we will only allow it to perform them, that it is not the source of toxins which are readily absorbed and produce serious chronic diseases. We also know that the normal natural functioning of the colon is essential to continued good health and well-being. Therefore I think that the functional disturbances of the colon are well worthy of our interest and attention.

ANATOMY AND PHYSIOLOGY

We learn from comparative anatomy that man has an unusually short uncomplicated

digestive tract, and we have abundant proof that only late in his development did he learn to use the products of the soil—primarily he was a hunter and fisherman. These anatomical facts indicate clearly that man's digestive tract was not designed for a diet containing excessive roughage.

The known functions of the colon are the absorption of water, the digestion of cellulose, the secretion of mucus, and the propulsion of its content from cæcum to rectum. The digestion of cellulose is a process of fermentation aided by bacterial action, and therefore it requires much more time than the rapid chemical reactions of digestion in the small intestine. The greater width of the colon and its sluggish activity are admirably adapted for this purpose, as for the absorption of water. We know from many experimental observations that these functions are carried out in the proximal colon, and that normally, this portion always contains food residues which by the time they reach the descending colon are practically dry and their bacterial content dead. Therefore if the colon is to carry out its proper functions the cæcum, ascending colon and transverse colon *are never empty*. This important point has an obvious bearing on the effects of laxatives on colon function.

Another point which has some bearing on our discussion concerns the innervation of the colon. The extrinsic nerve supply is double, through the sympathetic and para-sympathetic systems. We know that stimuli from the higher centres and cortex, and that conditioned reflexes are mediated through these nerves, but, unfortunately, we do not yet know the interrelation of the two systems. It was formerly

* From the Gastro-Intestinal Clinic, Department of Medicine, Royal Victoria Hospital, Montreal.

Read before the Montreal Medico-Chirurgical Society, October 18, 1935.

thought that the para-sympathetics were motor and the sympathetics inhibitory, but recent experiments seem to indicate that both systems carry motor and inhibitory fibres, and that "the specific effect either of vagal or sympathetic stimulation on the intestine is determined, at least in part, by the initial tonic state of its musculature. Chemical substances liberated at the periphery may also play a rôle in determining the type of response." (Kuntz⁶).

After section of all extrinsic nerves, the bowel is still able to function (though not normally), due to the activity of the neuromuscular mechanism in the wall of the gut. The enteric nervous system is responsible for conduction within the wall of the digestive tube, for peristalsis in the colon, for tone, and for other reflex activities. It is, in fact, "a reflex system capable of independent coordinated reflex activity but subject to reflex motor and inhibitory influences through the central nervous system". (Kuntz). Thus it is evident that the functional activity of the colon depends on two main groups of factors—internal mechanical and chemical stimuli acting through the reflex enteric system, and external stimuli such as the emotions and conditioned reflexes acting through the vegetative nervous system and able to dominate the internal factors.

DEFINITION AND TERMINOLOGY

At the outset we are met with a formidable array of terms—spastic colitis, spastic constipation, atonic constipation, tonic hardening of the colon, irritable colon, and so on—many of which are misleading and confusing. Thus, "colitis" should be confined to inflammatory conditions and, as it connotes in the lay mind a serious organic disease, should never be used in talking with functional patients. Also the term "irritable" is not satisfactory as it is usually understood to mean hyper-irritable. To avoid all confusion it has seemed desirable to find a term which would include all the functional disturbances of the colon, and then qualify that term should greater detail be necessary. Crohn, of New York, suggested "unstable colon" and this is now generally accepted. Unstable colon may be defined as a functional disturbance of the colon due to faulty correlation and coordination of its neuro-muscular mechanism, and evidenced by changes in tone, in irritability

or in both tone and irritability. Associated with these motor disturbances there may also be secretory disturbances, the so-called mucous colitis—another misleading term which should be dropped. These secretory changes require no special treatment and they disappear when the colon reassumes its normal function.

INCIDENCE

That unstable colon is a common condition is evidenced by the fact that in 3,000 consecutive admissions to the Lahey Clinic, Boston, Jordan and Kiefer⁴ report 30 per cent as having no other lesion than this disturbance of bowel function. Spriggs⁹ reports 50 per cent in his series. In regard to sex, females outnumber males two to one. The greater number of cases occur in adult life from the second to the fifth decade inclusive.

ETIOLOGY

The common etiological factors are divided into two groups—local and general. The local factors act directly on the colon having either a mechanical or a chemical effect which alters function; the general factors act either through the extrinsic nerves or possibly the blood stream.

Local factors.—(1) *Food.* There are two points about diet to which I would draw your attention. The first is *roughage*. While it is an undisputed fact that a certain amount of food residue is essential to provide the necessary stimulus for normal bowel activity, it is equally true, as we have seen, that the colon of man is not designed for excessive residue. A few hardy healthy individuals may be able to eat bran, cabbage and other roughage food and feel no ill effects. But with the vast majority the colon rebels. Distension and increased peristalsis may at first cause the illusion of improved function, but fatigue, loss of tone and increased irritability rapidly supervene and proper function disappears. Fear of obesity and misinformation regarding constipation have been responsible for the large amount of roughage used at the present time.

The second point about diet concerns *food allergy*. It has been shown that many persons are hypersensitive to certain types of food and that this manifests itself not only in disturbances of digestive function but also by systemic reactions such as headache, malaise

and urticaria.⁵ When food allergy is suspected the patient is put on a basic diet of non-irritating foods, which is gradually increased until the offending food is discovered by the appearance of symptoms.⁷ Skin reactions to food proteins have proved to be of little practical value in this condition.

(2) *Cathartic excess.* Spriggs reports that of 1,000 patients who showed colon delay by x-ray 764 complained of constipation, and of these 670 used laxatives—431 daily laxatives. The effect of laxatives on the colon is one chiefly of irritation. Food is rushed through the digestive tract, and the proximal colon which, as we have seen, is normally full and functions slowly over a period of days, is completely emptied of its partly digested content. In illustrating this point, Alvarez¹ has compared the colon to a railway siding which holds just three cars. Each day the engine brings along another car and bumps off one at the far end of the siding. Now if the siding is completely emptied of all three cars in one day, it will take three days for the siding to fill again and allow the normal routine to be resumed. This is what happens in the colon after a laxative. Most people do not wait for it to fill again before taking more medicine, and so the pernicious habit is established, without giving the colon a chance to function naturally. The resulting upset of colon function starts a series of digestive symptoms which often leads to prolonged ill health.

Apart from the local effects of catharsis there is also a general effect which is quite important. A natural normal bowel movement is accompanied by a sensation of relief and well-being amounting almost to pleasure. Psychiatrists are familiar with the exaggeration and perversion of this normal sensation in what has been called *anal eroticism*. Now in patients with unstable colon this sensation is completely lost. I have never observed a patient who was able to state that any sensation of this kind accompanied a bowel movement obtained by catharsis, in fact, the usual story is that they feel wretched after the bowel moves. The ultimate result is that these patients become irritable, cranky, annoyed by trifles. I remember one man who was forced to give up his business and retire because he was so irritable that he found it almost impossible to concen-

trate on his work and make reasonable decisions. He became even worse after retirement, but when natural bowel function was restored this irritability completely disappeared and he felt well enough to resume his business associations. I have observed this so often that I now regard the decrease of general nervous irritability and the return of normal bowel sensation as a criterion of improved colon function.

(3) *Colonic irrigations and irritating enemas.* Closely allied with the use of laxatives by mouth is the effect on colon function of the injection of irritating substances by rectum. Colonic irrigations have the same action in emptying the bowel as laxatives and are equally harmful. They are now used chiefly in association with dietary fads and are mentioned only to be condemned. The common soap suds enema is also irritating. Several years ago when doing some experimental work on the colon in animals, I took the opportunity of observing the effect on colon peristalsis of the injection of soap solution. The waves became greatly exaggerated and there was a marked longitudinal contraction. When the anus was partly obstructed (as it would be by painful spasm in the human) the movements were convulsive. Further, proctoscopic examination of patients up to 48 hours after a soap suds enema reveals an injected, irritated, sometimes œdematous-looking mucosa. And yet in our hospitals almost immediately after abdominal operations these enemas are ordered p.r.n. It is a wonder that post-operative hæmorrhage and breaking down of sutures do not occur more frequently. I think it is almost as dangerous to stimulate violent peristalsis in this way after an abdominal operation as it is to prescribe castor oil in the presence of acute appendicitis. If it is necessary to cause a bowel movement, why force two quarts of irritating soap solution into the colon when all that is needed is a pint of warm saline or a few ounces of warm oil? Small non-irritating enemas have their place in the treatment of colon conditions—irritating enemas cause colon instability and should rarely if ever be used.

GENERAL FACTORS

As we have seen, it is difficult to evaluate the action of the autonomic nervous system on the colon, and, for the purpose of this discussion it would not be profitable to attempt to distinguish

retention enema occasionally in order to assist in establishing normal colon rhythm, but there is no substitute for the patient's own effort to obtain a natural bowel movement. If there is marked weakness of the abdominal muscles regular trunk-bending exercises should be prescribed. The patient should be advised to undertake no form of exercise which causes physical exhaustion, but should be told that some exercise is necessary each day after the preliminary period of treatment.

In my experience, surgery has no place in the treatment of unstable colon. In the series of cases which I reviewed no less than 28 per cent had had abdominal operations without relief of symptoms. Appendicitis was the most common pre-operative diagnosis, gallbladder disease next, and in many instances the patients were subsequently told that no disease had been found. In addition, over 5 per cent had submitted to a second operation for adhesions. It is certainly a mistake to explore a patient with unstable colon unless the indications of supervening organic disease are very clear and definite.

PROGNOSIS

Generally speaking, the prognosis is good, especially if it is possible to obtain the intelligent cooperation of the patient. Relapses may occur from time to time and are almost invariably due to persistent dietary indiscretions, to careless bowel habits, or to nervous fatigue. It is necessary for patients to follow

their régime closely for several months before experimenting with forbidden foods. Some find it essential to continue indefinitely in order to avoid symptoms—others rapidly disregard all dietary restrictions without loss of normal bowel function or return of indigestion. It is important for the patient to know that he must revert to strict régime as a measure of prevention during periods of unavoidable stress, during acute infections, and when there is any recurrence of symptoms.

CONCLUSIONS

Unstable colon is a functional disorder which presents a definite clinical syndrome. The most valuable laboratory data for diagnosis are obtained from the barium enema when carried out under constant conditions. It is a very disabling condition and successful treatment depends on reassurance, rest to both the patient and colon, and education in bowel hygiene.

REFERENCES

1. ALVAREZ, W. C.: Nervous Indigestion, Hoeber, New York, 1930.
2. ALVAREZ, W. C. AND HINSHAW, H. C.: Foods that commonly disagree with people, *J. Am. M. Ass.*, 1935, 104: 2053.
3. EVE, F. C.: Disordered regulation of traffic in the gut, *Brit. M. J.*, 1933, 1: 364.
4. JORDAN AND KIEFFER: The irritable colon, *J. Am. M. Ass.*, 1929, 93: 592.
5. KANTOR, J. L.: The unstable colon, *Southern Med. J.*, 1932, 15: 29.
6. KUNTZ, A.: The Autonomic Nervous System, Lea & Febiger, Phila., 1934, p. 258.
7. ROWE, A. H.: Revised elimination diets for the diagnosis and treatment of food allergy, *Am. J. Digest. Dis.*, 1934, 1: 387.
8. SMUL, J. S.: Fifty so-called gastro-intestinal diseases—caused by food allergy, *Am. J. Digest. Dis.*, 1935, 2: 178.
9. SPRIGGS, E. I.: Functional disorders of the colon, *Quart. J. Med.*, 1931, 24: 533.

USE OF FEMALE BITTERLING AS TEST FOR MALE HORMONE.—In the attempt to determine the cause of a positive reaction of the ovipositor in the bitterling to the hormones circulating in urines Kleiner, Weisman and Mishkind tested many substances, including crystalline theelin and theelol as well as various proprietary hormone preparations, including a number cytogenic in nature. As a result of these tests they arrived at the hypothesis that the responsible factor was not one of the female sex hormones but one of the so-called male hormones. Since the ovipositor stimulating substance or substances are added to the water in which the female fish swims, it would appear that she reacts to a hormone contributed from a source outside her own organism. That this source might be a male bitterling would seem likely, since the lengthening of the ovipositor occurs normally as a part of the reproductive cycle in the spawning season and when the female is in close association with the male. When the breeding season occurs it is probable that the male secretes his hormone and excretes it into the water near the female. She is thereby stimulated to react by a lengthening of the ovipositor, through which the ova pass when being deposited at their natural site. This hormone mechanism would insure the presence of a male in the neighbourhood of the female at spawning time. Naturally this hypothesis presupposes that the male

hormone of the fish and that of man have similar activity. In brief, the male hormone furnishes the necessary stimulation to induce ovipositor elongation in the female. The male hormone present in male urine, presumably androsterone, produces the ovipositor lengthening reaction in the female bitterling. The anterior pituitary-like hormone does not give this test. Fractions containing theelin and theelol, and these crystalline hormones themselves, do not give this reaction or do so in a very slight degree. The authors recommend the use of this reaction as a new test for male hormone. In order that the test may be used in a uniform manner by all, they suggest a procedure and at the same time define a unit as follows: One bitterling unit is the smallest amount of material which, when added to an aquarium containing two female bitterlings in 4 litres of water, will cause marked lengthening of the ovipositor (to the end of the anal fin or beyond) in at least one of the two within forty-eight hours. Other necessary conditions are: (1) the fish must have been in the test aquarium for from 18 to 24 hours before the suspected material was added, and (2) at least half of the water used should be taken from the stock tank. The simplicity of the bitterling test should make it of great value in the isolation and purification of male hormone. It should also aid in the establishment of a definite clinical diagnosis of many endocrine disorders.—*J. Am. M. Ass.*, 1936, 106: 1643.

TUBERCULOSIS AND THE STUDENT NURSE

BY R. J. COLLINS, M.D.,

Medical Superintendent, Saint John Tuberculosis Hospital, Saint John, N.B.,

AND C. W. MACMILLAN, M.D., D.P.H.,

District Medical Health Officer, Saint John, N.B.

A CONSIDERABLE literature has accumulated on the problem of tuberculosis among student nurses. In this discussion an attempt will be made to correlate the expressed opinions of various writers on this subject. Perusal of the available literature points in the main to a high incidence of pulmonary tuberculosis in these young women. It would be difficult to state just how serious the problem has become, because the investigators vary in their conclusions. Undoubtedly many factors are to be considered—the general morbidity and mortality from tuberculosis in the area surveyed, age and physical condition of the student nurses; their living conditions, with especial reference to overcrowding; classification of the patients admitted to the hospital in question; and the care taken in segregating those with tuberculosis.

The members of the Canadian Hospital Council felt that a thorough study of the health of the student nurse was essential, and appointed a committee under the leadership of Dr. R. T. Washburn.* Our own assignment covered a special study of tuberculosis, a piece of work already under way in 1930.

During this year we were impressed with the value of the material available for a study of tuberculous infection and disease in the student and graduate nurse. As a result, several lines of activity were initiated. Inasmuch as we had no follow-up of the students who had completed the course in tuberculosis from 1924 to 1930 we decided to contact every one. We finally succeeded in tracing all. This would never have been possible without the hearty support of the superintendents of the various training schools, the Department of Health through the travelling diagnosticians, and the individual medical practitioners.

From June, 1930, the following plan of in-

vestigation was instituted. Every student on admission to our hospital was subjected to the following routine: an adequate family history with special reference to tuberculosis; a past personal history of infections, surgical procedures, anaesthetics, etc., weight variations during the five years preceding the examination; sleeping and eating habits; exercise and fatigue. A general physical examination, followed by postero-anterior and lateral x-ray films, was also routine. It was felt that the lateral films would give a better view of the root glands, and they were utilized to determine evidence of replacement calcification in these areas. All student nurses whose films showed suspicious-looking areas were re-examined at intervals during the two months' course, and in some instances we asked for further skiagrams during the later period of observation. Universal tuberculin testing, using 0.001 mg. and 0.01 mg. old tuberculin (Lederle, freshly diluted) by the intradermal method, was carried out on admission, and, if negative, on completion of the special training in tuberculosis. In order to complete our whole picture we have carried out a yearly follow-up of every student who has finished the course.

It was necessary to divide the work into two phases, 1924 to 1929 and 1930 to 1934, inclusive. We will report on a total of 358 undergraduate nurses during the first period, and 285 undergraduates and 48 graduates nurses, the latter group in the newly instituted graduate school. When we refer to tuberculosis in the sense of morbidity and mortality the combined figures are used. Where we mention specific data on tuberculin testing, weights, other contagious and infectious diseases we refer to the later period, 1930 to 1934. Inasmuch as a wide difference of opinion exists as to the morbidity from tuberculosis in student nurses, as compared with that found in young women in other occupations, we have applied the same experimental method to

* Tuberculosis in the Nursing Profession, Bulletin No. 18, Canadian Hospital Council, 1935.

the survey of normal school students, and a subsequent follow-up for the period of 1930 to 1934. We are fortunate in New Brunswick in having available the material from a yearly survey of normal school students who are examined and x-rayed, under the direction of the Department of Health, by the travelling diagnostician. This was introduced in 1928. We have also gathered data from the various maritime training schools in nursing affiliated with our institution. Of this number, 285 had taken the special course in tuberculosis and 431 had not. Finally, to complete the picture, we have secured from seven Canadian sanatoria the incidence of tuberculosis in their graduate nurse personnel. The data from this source cover the same period, from June, 1930, until June, 1934, and are therefore comparable.

Age.—We found that 93.3 per cent of the student nurses were in the age-group 19 to 24 years; 75 per cent of the graduates in that of 22 to 27 years; and 93 per cent of the normal school girls, in that of 17 to 19 years. We would like to stress this point, because our own Provincial statistics of 1931 give us these very interesting data. The death rate in the 15 to 19 year age group was 124 per 100,000 and comprised 56.5 per cent of the total deaths from all causes; and in the 20 to 24 year group, 172 per 100,000, 67.7 per cent of the deaths from all causes. We all recognize this dangerous age period, 15 to 24 years, and we note that the student nurse, the graduate nurse (post-graduate course) and the normal school students fall within, or very near, to this period.

Residence.—It may be said that a large majority of our nurses in training and normal school students are from towns, villages and country districts, but few from cities.

Weight and general nutrition.—These data were not complete but were as accurate as could be obtained in 297 of the 363 student and graduate nurses. The maximum and minimum weight during the five years preceding the

course, the weight at the beginning of the probation period, and any marked variation during the training were noted. It was found that 80.5 per cent had gained and 19.7 per cent had lost weight during their training (up to the twenty-second month). The average gain was 19 pounds. It would seem obvious from this that a large majority of the nurses, under supervision, gain weight. This same feature is well recognized in troops in training, and would indicate that routine work, adequate diet, and freedom from immediate worry, bring about improved appetite and nutrition.

Fatigue.—We did not get the impression from our histories and personal observation that in the main these young women were markedly fatigued at the end of the day's work. It was found that the average number of hours of sleep was approximately seven, and a history of insomnia was evident in less than 10 per cent of the total number. We certainly can present no sufficient evidence to prove that the student nurses in our group developed tuberculosis as a result of malnutrition, fatigue, infectious disease, operative procedures or lack of physical rest.

Family history.—We were particularly interested in the question of contact with open tuberculosis in the family, and the following data were secured.

285 Undergraduate nurses	48 Graduate nurses	960 Normal school students
Family contact 27 or 20 per cent 1 contact with school teacher	3 or 6.3 per cent	76 or 8 per cent

We feel that a certain percentage of the nurses were not certain whether or not tuberculosis existed in their families, or that possibly they wished to conceal the fact. It is most difficult to be certain of the accuracy of those percentages.

History of pre-existing tuberculous disease.—From the histories, the following data were secured:

<i>Tuberculous adenitis (scrofula)</i>	<i>Pleurisy with or without effusion</i>	<i>Erythema nodosum</i>	<i>Definite parenchymatous disease</i>	<i>Total tuberculous disease</i>
Undergraduates				
4	14 (4.9 per cent)	2	1	21 (7.4 per cent)
Graduates	4	0	1	5 (10.4 per cent)
Normal school	27 (2.8 per cent)	0	1	28 (2.9 per cent)

In other words, 7.4 per cent of the undergraduate nurses gave a definite personal history of disease that may be interpreted as being due to the tubercle bacillus before entering a training school. One may criticize these figures, and I believe rightly so. There can be little doubt that the diagnosis was correct in the tuberculous adenitis cases—the history and the evidence of scars were sufficient. Our greatest difficulty was the proper interpretation of dry pleurisy. We felt that so far as the nurses were concerned they were convinced that they had definite pleurisy. It was of such an outstanding nature that they remembered the pain, shortness of breath and fever continuing for several days. The effusion cases were quite definite and were not associated with pneumonia.

It is notable that the normal school student gives a much lower percentage of pre-existing tuberculous disease. The same possibilities were present in both, and it may be concluded that a more careful history was available from the nursing groups.

The most interesting feature of this group with historical tuberculous disease was that only one later presented activity during the ten-year study.

Reaction to tuberculin.—It is well to remember that the student nurses in this survey were not tuberculin-tested until after they had spent an average of 22 months in general hospitals; and the graduates, from two months to several years after graduation. The skin testing was carried out in one class of normal school students at the end of two months training.

root glands or lung parenchyma did not react to either of these dilutions.

Physical examinations.—We shall pass over this phase of the work as we soon found that our tuberculous disease in most instances was detectable only in x-ray films of the thorax.

X-ray examinations.—As stated before, the use of posterior-anterior and lateral exposure was universal, because we felt that such procedure would more clearly determine the question of calcification in the parenchyma of the lung and in the root glands. Due allowances were made for blood vessel shadows and artefacts, and a final decision given in only those presenting what is commonly considered reasonable evidence of replacement calcification. It was found that 56 per cent of the x-ray films on nurses at the beginning of their course in tuberculosis gave evidence of this pathological change, compared to 52 per cent of the graduate group. If the observation that calcification of the above type indicates tuberculous infection, then we may conclude that a fairly high percentage had passed through this phase of their disease.

We found that of the nurses who subsequently developed active disease 5, or 13.1 per cent, gave evidence of calcification in the intrapulmonary areas or in the root glands. Special note of this observation is made because it has been stated that individuals demonstrating such x-ray films are more prone to subsequent breakdowns. The evidence in our nursing population certainly does not confirm this. In 9 of the 38 nurses who subsequently developed active dis-

	Positive reactions on admission to course	Negative on admission. Negative on discharge	Negative on admission. Positive on discharge
Undergraduates	0.001 mg. 0.01 O.T. 165 65 - 84 per cent	0.01 Neg. O.T. 19 - 7 per cent	0.01 Neg. O.T. 26 - 9 per cent
Graduates	42 5 - 98 per cent	0	1 - 2 per cent
Normal school students	0.001 mg. 42.5 per cent		

After twenty-two months of training in our Maritime general hospitals, 84 per cent of the student nurses reacted positively to tuberculin, and at least half of the negative reactors became positive at the end of the special course in tuberculosis. Ten, or 3 per cent, of the students whose x-ray films showed calcified areas in the

ease we felt that we were justified in stating that the condition was latent. (We interpreted latency in the terms of practically obsolete disease, but we now know that activity was "just around the corner").

Again, checking over the instances where no definite diagnosis was made, but where there

was a suspicious-looking x-ray film, not one of these persons has developed disease. In other words, experience taught us that a diagnosis could only be made with some definite localized shadow, and could not be made on increased thickness of linear shadows or increased vascularity. In several instances a diagnosis was made of active disease, and these nurses were immediately taken from their work and placed on treatment. It may be said that in nearly every one the symptoms were few and the x-ray was the final court of appeal.

X-ray films on 6 others were considered positive, the diagnosis being made on small localized areas. Not one of these persons had a single symptom, except for a sequence of events that we have learned to heed. They were well nourished, healthy girls. They were allowed to continue their work under supervision, and at the end of two months were re-checked for further evidence of activity. The superintendent of their own training school was advised about their condition, yet in every instance they subsequently had a breakdown. This brought us to the conclusion that a positive x-ray of disease, irrespective of size, is enough evidence for the immediate placing of such persons under treatment. It proved conclusively to us that in this particular age-group any evident tuberculous disease is serious.

We are left with 15 nurses, in ten years, who developed tuberculosis during or following the special training in tuberculosis. By no stretch of the imagination, either from symptoms, physical or x-ray examination, did they present evidence of active disease on their first examination. However, at the time they began their course all had positive reactions to tuberculin. It is interesting to note at what time these nurses developed their active disease. It is evident that in the majority it became active during the course or within six months of its completion.

It was felt that a clearer picture of the problem of tuberculosis in student nurses could be obtained if data were available on all over the period of their training and one year after graduation. The superintendents of nurses in the various affiliating institutions gave splendid cooperation. Seven affiliating hospitals during the period of 1930 to 1934 had a total student population of 616. Of this group 285 came to us for special tuberculosis training. Of this

total number (616) 19, or 3 per cent, could not complete their period of probation because of active or suspected disease; another 25 (3.5 per cent), fell by the wayside before the twenty-second month; and 1.6 per cent developed tuberculosis during or following the two months' affiliation at the Saint John Tuberculosis Hospital (up to the end of the observation period). Therefore 7.1 per cent of the nurses in training and after graduation developed active disease during a four-year period. In contrast, of the 691 nurses taking the special training in tuberculosis, that began on an average at 22 months, 38, or 5.5 per cent, were either found to have disease at the beginning of their special training or developed activity during the subsequent ten years of observation.

A four-year follow-up of normal school students inclusive of those discovered with tuberculosis in the surveys of the years 1930 to 1934 presented us with a total of 39 breakdowns, or 4.1 per cent, in this group. Finally, data secured from eight Canadian sanatoria on 394 graduate nurses of all ages, but mainly in the 25 to 30 year age group, accounted for a total of 15 nurses (4.07 per cent) who developed tuberculosis during the same period, 1930 to 1934 inclusive.

It would appear that the highest incidence of active disease occurs during the early months of training, and presents a distinct problem in itself, because there is a considerable elimination of the nursing population from this disease alone.

DISCUSSION

Braeuning¹ found the presence of active tuberculosis in 15 out of 18 nurses (83 per cent) who had spent some time in the nursing of patients with this disease. He was also of the opinion that 15 to 30 per cent of activity could be traced to their occupation, in other words, exogenous infection. He considers that a lack of knowledge of the disease as being infectious, bad hygienic surroundings in certain sanatoria, and inadequate disinfection of cooking utensils and dishes were responsible. Much² reports on the physical condition of 4,284 nurses and nuns, and states that 150 had developed tuberculosis in thirty-seven years. Until 1918 only 1 per cent had been discovered, but since that time 4.6 per cent developed the disease. The highest incidence occurred in the 20 to 24 year age-period. He attributes the increase to overwork and lowered resistance from other infections. Kirchner³ reports 1.44 per cent of 14,140 graduate nurses developing tuberculosis, and further presents the following interesting data. Nurses employed in general hospitals break down at the rate of 1.36 per cent of their total population, against 1.89 per cent in institutions for the treatment of tuberculosis and 2.44 per cent in outdoor medical clinics.

Heimbeck⁴ considers that fully 12 per cent of student nurses in the Oslo General Hospitals finally developed clinical tuberculosis. Whitney,⁵ basing her conclusions on work done in Chicago and San Francisco, estimates the incidence of tuberculosis among nurses in training, one-third higher than among women of the same age-group in the general population. Shipman and Davis⁶ found that 2.1 per cent of pupil nurses in the University of California Hospital developed tuberculosis. Meulengracht,⁷ in a study of illness in student nurses in the Danish Schools of Nursing found from 5 to 6.72 per cent with tuberculosis. Greer⁸ reports 4.5 per cent of the same population in the Ancher Hospital of St. Paul had developed the disease from 1920 to 1928. He points out in his excellent article *the marked increase in the number of positive tuberculin reactions after six months' training*. One hundred and forty-three out of 147 were positive, whereas only 33 or 0.3333 per cent were evident on admission.

Jacobson⁹ reports an incidence of 5.21 per cent of tuberculosis over a period of five years. Kristenson¹⁰ states that the incidence of tuberculosis in student nurses is higher than in cooking school teachers in the same institution, and that those who reacted negatively to tuberculin on admission became positive about ten months later. Seventeen per cent of a group of 126 young women in training developed some form of tuberculosis, and of that group, 75 per cent of the cases occurred during the first year. He also makes the interesting observation that pupil nurses whose parents were tuberculous, or who had a definite history of contact in childhood, showed less morbidity than others, and, further, that of the students with positive tuberculin reactions at the beginning of training few developed tuberculosis. Bechshoft,¹¹ on the other hand, reports a total of 1.8 per cent in 341 student nurses in the Copenhagen City Hospital developing tuberculosis in five years. Myers¹² has given an excellent summary of the literature pertaining to this subject, and expresses the opinion that a considerable percentage of such breakdowns are due to exogenous infection received during training. Rossi¹³ and Stewart¹⁴ felt that the number of nurses who develop tuberculosis is far greater than the expectancy in the general population in the same age period. They also feel that nurses head the list of employed women in breakdowns from tuberculosis in their province (Manitoba). The majority of the nurses developed clinical evidence of the disease either during training or shortly afterwards, and 6 per cent of the nursing personnel in Manitoba have developed active tuberculosis during the four years of the observation. Ferguson,¹⁵ of Saskatoon, in a recent communication estimates that approximately 1.3 per cent of the nursing population developed active tuberculosis during a period of three years, or eight times the incidence found in 3,376 normal school students, mainly young women in the same age group.

This accumulated evidence points to a considerable incidence of tuberculosis in the student nurses. It is not quite so obvious why there is such a wide variation in the reports. The explanation that naturally comes to one's mind is a wide variation in the extent of exogenous infection during training. Hospitals with but a few patients with open tuberculosis would, naturally, carry less probability of infection. Institutions with immediate and rigid surveillance of incoming patients, eliminating or segre-

gating the infectious, would also prove safer places for the training of nurses.

From our own observations we were not impressed with the importance of malnutrition as a factor. This was evident from the gain in weight of the majority of nurses in training. We are convinced that their dietary was adequate, and have been confronted with the anomalous situation of active tuberculosis occurring in the apparently healthiest of our nursing population. Over-crowding may have been a factor influencing the onset of disease in a few of our nurses, but it was not evident in the remainder. With decreasing hours of labour, excessive fatigue should not be a factor, and we have obtained no evidence that our student nurses were rendered less resistant by this alone. Various other infections seem so far removed in point of time from the breakdown that we could not associate this factor with the final illness. Further, it is interesting to note how well the nurses with historical tuberculosis stood the strain of training, and that only 13 per cent of those with demonstrable calcified parenchymal or root-gland lesions swell the ranks of the ill.

We would like to suggest the viewpoint, as the result of our study of the student nurses over a ten-year period, that subsequent reinfection in young women who demonstrated evidence of childhood infection, as indicated by the x-ray appearance and positive skin tests does not eventuate in clinical tuberculosis to any great extent, but that what may be operable is a primary infection acquired early in training, with rapid, repeated and probable massive infections, eventually producing the more or less acute adult type of tuberculosis so often seen in nurses. This primary infection may pass unnoticed. We are all aware of the fact that many children, followed from the time of known contact until they eventually demonstrate a positive tuberculin reaction, may be asymptomatic and present nothing diagnostic of the so-called "primary complex".

What evidence we can secure in New Brunswick leads us to believe that the student nurse and recent graduate have a somewhat higher incidence of active tuberculosis than the normal school student (young women), or the older graduate nurse in sanatoria, but the difference is not so great as at first was supposed. We must remember that the student nurses are in a

class by themselves, in that they are more frequently examined than any other group of employed young women. Vital statistics available do not place the nurse in an unfavourable position regarding tuberculosis mortality. Deacon, in a study of mortality from tuberculosis in Michigan, found that school teachers have a specific death rate of approximately 40 per 100,000, and that of nurses is 12 per 100,000. Recognizing the problem, and feeling as we do that exogenous infection is of considerable importance in the subsequent history of tuberculosis in our nursing population, it seems obligatory upon all hospitals to take measures for reducing the incidence of tuberculosis to the minimum.

It is difficult to arrive at a practical solution of the problem, but we believe the following suggestions should be carried out by the hospital and training schools.

(1) Non-acceptance of young women into a training school, unless the medical staff of the particular hospital related thoroughly examine and x-ray every applicant. We feel that this measure would greatly reduce the breakdowns during the probation period. (2) It would be sound policy to introduce tuberculin testing (probably intradermic) as a routine measure for all applicants, and in districts with a high incidence of early infection to eliminate the non-reactors. (3) A full explanation of the communicable nature of tuberculosis should be given to incoming students and adequate routine protective measures insisted upon. (4) Consider every patient with a cough, entering a hospital, as potentially tuberculous, until proved otherwise, and special precautions should be taken to protect the nurse. (5) Isolation of all persons in a general hospital who have open tuberculosis. (6) Believing that the important portals of entry are the mouth and nose, equip the nurse with sufficient gauze, or, still better, light cellophane masks, to protect these portals. On this point we would like to say that since November, 1933, we have used masks on every nursing attendant in contact with patients. Plainly marked gauze masks were used, but later we introduced those of light cellophane which can be worn but in one way. They are daily exposed to ultra-violet light for sterilization. (7) More adequate arrangements for frequent hand washing. (8) Frequent change of nurses' gowns. (9) A half yearly review (x-ray) of the nursing personnel, or more frequently if symptoms such as fatigue, loss of weight and appetite occur. We should thus be in a better position to obtain good results from treatment.

TUBERCULOSIS AMONG HOSPITAL EMPLOYEES.—A. Gullbring gives an account of the tuberculosis rate among the employees working in his tuberculosis hospital in Sweden between 1918 and July, 1935. During this period tuberculosis developed in 45 members of a staff of 2,016 (2.2 per cent). When the hospital's employees were classified according as their work did or did not bring them into contact with the patients, it was found that the tuberculosis rate among the former was 2.6 per cent, and only 1 per cent among the latter. Since 1928 all the younger members of the staff have undergone the

CONCLUSIONS

1. A survey of undergraduate nurses is presented, and indicates a considerable incidence of active tuberculosis.
2. A high percentage of breakdowns occur during the first two years of training.
3. It seems evident that exogenous reinfection is an extremely important cause of breakdowns.
4. Evidence is presented that seems to indicate a high incidence of tuberculosis in both normal school students (later teachers) and graduate nurses in sanatoria.

We wish to thank the Department of Health, the superintendents of nurses of the various affiliated training schools who so kindly supplied the statistical data regarding their own personnel, and the medical superintendents of the Canadian sanatoria for the data on graduate nurses employed in their institutions.

REFERENCES

1. BRAEUNING, H. B.: Tuberkulose Erkrankungen bei Schwestern infolge von Ansteckung im Kienst und ihre Verhütung, *Ztschr. f. Tuberk.*, December 1920, 33: 129.
Ibid.: Einige Fälle von Erkrankung an Tuberkulose infolge von Dienstbeschädigung bei der Behandlung und Pflege Tuberkulöser, *Ztschr. f. Tuberk.*, 1925, 43: 441.
2. MUCH, H.: Die Tuberkulose des Pflegepersonals, *Beitr. z. Klin. d. Tuberk.*, 1926, 64: 155.
3. KIRCHNER, M.: Tuberkuloseerkrankungen und Todesfälle bei Ärzten und dem Pflegepersonal und die Frage der Dienstbeschädigung, *Ztschr. f. Tuberk.*, 1925, 43: 345.
4. HEIMBECK, J.: Immunity to tuberculosis, *Arch. Int. Med.*, 1928, 41: 336.
Ibid.: Immunity to tuberculosis, *Inter. Clinics*, Dec., 1927, 4: 6.
5. WHITNEY, J. S.: Tuberculosis among young women, *Am. J. Nursing*, 1928, 23: 8.
6. SHIPMAN, S. J. AND DAVIS, E. A.: Tuberculin hypersensitivity and tuberculous disease among nurses, *Am. J. Nursing*, 1928, 23: 8.
7. MEULENGRACHT, E.: Tuberkulosemorbidityten blandt Sygeplejeelever paa Bispebjerg Hospitals Sygeplejeskole, *Hospitalstidende*, Copenhagen, 1930, 73: 579.
8. GREER, E. K.: Tuberculosis among nurses, *Arch. Int. Med.*, 1932, 49: 77.
Ibid.: Primary tuberculosis among nurses, *Am. Review Tub.*, 1934, 29: 88.
9. JACOBSON, C. J.: Tuberculosis morbidity and Pirquet tests of student nurses at Frederiksberg Hospital, *Hospitalstid.*, 1933, 76: 763.
10. KRISTENSON, A.: Zur Kenntnis der Tuberkulosefrequenz beim weiblichen Krankenpflegepersonal, *Acta Tuberc. Scand.*, 1932, 6: 117.
Ibid.: Zur Kenntnis der Tuberkulösen Infektion bei Krankenpflegeleerinnen, *Acta Tuberc. Scand.*, 1933, 7: 1.
11. BECHSHOF, N. P.: Antallet af tuberkulosestilfælde blandt sygeplejeeleverne paa kommunehospital, *Ugeskrift f. Læger*, 1930, 92: 603.
12. MYERS, J. A.: The prevention of tuberculosis among nurses, *Am. J. Nursing*, 1930, 30: 1.
13. ROSS, E. L.: Tuberculosis in nurses, *Canad. M. Ass. J.*, 1930, 22: 347.
14. STEWART, D. A.: Tuberculosis among nurses, *Am. J. Nursing*, 1932, 11: 65.
15. FERGUSON, R. G.: Circular letter dated June 7, 1934.

intracutaneous tuberculin test on joining the hospital, and 20 per cent of them have been found to be negative reactors. The subsequent tuberculosis morbidity among the negative and positive tuberculin reactors was 8.4 and 2.8 per cent respectively—findings confirmatory of those of Heimbeck at the Ullevaal Hospital in Oslo, where the chances of a negative reactor developing tuberculosis have been found to be comparatively high. The author's observations do not, however, tally in every respect with those of Heimbeck.—*Nord. Med. Tidsskrift*, Jan. 4, 1936, p. 14).

THE SEDIMENTATION TEST IN PULMONARY TUBERCULOSIS*

(A REVIEW OF 635 CASES)

BY A. H. DUNCAN, M.D.,

*Muskoka Hospital for Consumptives,**Gravenhurst, Ont.*

THE sedimentation of the red blood cells has been the subject of considerable study in recent years. While there is much yet to be learned in regard to this phenomenon, the test of sedimentation rate has had a wide application and has been a valuable addition to the list of our laboratory procedures. In pulmonary tuberculosis especially the test has been recognized as a technical aid lacking heretofore in the management of this disease.

The cause of a change in the rate of the sedimentation of the red blood cells has never been satisfactorily explained, although several theories have been advanced, chief of which are: (1) the electrophysical theory—that it is due to some change in the electrical charge of the particles in suspension in the blood; (2) that it is controlled by the viscosity of the blood, auto-agglutination taking place under certain conditions; (3) that it depends on a change in the composition of the plasma proteins, the fibrinogen-globulin-albumin ratio. This theory appears to have the greatest following, although two investigators¹ in a recent article conclude, after careful blood analysis of a number of cases of rheumatoid arthritis in which the blood sedimentation is accelerated, that there is no parallelism between the fibrinogen, globulin or albumin percentage of the plasma proteins or ratios of these and the sedimentation rate. Whatever the cause, the test seems to be an indication of the degree of tissue breakdown going on in the body. Thus, an increased rate of sedimentation is likely to be found in acute or chronic inflammation and in malignancy. As far as known the only physiological condition in which an increased rate of sedimentation occurs is pregnancy, especially in the later months.

It should be pointed out at this juncture that a normal sedimentation reaction may be found in the presence of destructive but quiescent disease. As Cutler² puts it, "A normal sedimenta-

tion reaction indicates one of two things: either health or the existence of destructive disease not sufficiently active to disturb the natural stability of the blood; an increased sedimentation reaction is always abnormal, and, except in pregnancy, indicates the presence of disease." He also points out that, while the reaction is not of specific diagnostic value, it should be regarded as a diagnostic lead, demanding further investigation as to its cause.

Pulmonary tuberculosis is a chronic inflammatory disease with acute manifestations, in which at times there is much tissue breakdown. The sedimentation test in pulmonary tuberculosis therefore has come to be regarded as an index of the degree of tissue breakdown taking place, or the activity of the disease at the particular time under consideration. As an index of this sort it is reported to have an accuracy of 94 per cent³ and to be a more reliable reflection of the real condition of the patient than that obtained by an assessment of other symptoms and signs of activity, such as fever, increased pulse rate, cough and sputum, sweats, anorexia, loss of weight, râles, etc.

The test has also been found to have considerable prognostic value in pulmonary tuberculosis. Trail,⁴ in a study of 500 cases two to six years after discharge, concludes that the sedimentation test is a decided help, that the prognosis becomes increasingly grave with the higher rates of sedimentation, and that the patient's fitness for work ought to be founded as much on the movements of his sedimentation rate as on his pulse, temperature, "exercise tests" and sputum. The red cell sedimentation test, therefore, has been found to be of value, (1) as a diagnostic lead; (2) as an index of activity or the degree of tissue breakdown, especially in pulmonary tuberculosis, and, from this, a means of determining the progress of the patient; (3) in prognosis. The 635 cases in this series have been reviewed with these thoughts in mind.

* A paper read before the Laennec Society on October 25, 1935, at Gravenhurst.

The test was adopted in the Muskoka Hospital for Consumptives as a routine procedure in July, 1930, and since that time it has been carried out on all patients on admission, and at least every two months subsequently while in residence. The 635 patients of this study were the monthly admissions from July, 1930, to July, 1933. Our follow-up records have enabled us to keep in touch with the majority of these patients since discharge, and up to the last few months in many cases.

The method used is a modification of that advocated by Westergren.⁵ It has been found to be simple, satisfactory and practical. The other methods in use are Linzenmeier's,⁶ a determination of the time taken for the deposit to fall a set distance; and Cutler's,⁷ in which the readings are taken every five minutes for one hour, and recorded graphically with the sedimentation in millimetres as ordinates and the time in minutes as abscissæ. Four lines or curves are emphasized: (1) the horizontal line found in clinically normal individuals; (2) the diagonal line found in clinically quiescent tuberculosis; (3) the diagonal curve found in clinically slightly active tuberculosis; (4) the vertical curve found in clinically markedly active tuberculosis.

Blood for our tests was taken as a rule between the hours of 9 and 10.30 a.m. Into a 2 c.c. sterile syringe is drawn 0.4 c.c. of a 3.8 per cent (isotonic) sterile solution of sodium citrate. This prevents the clotting of the blood, which is then taken from a superficial vein at the elbow and drawn up to the 2 c.c. mark. The mixture is ejected into a small bottle and thoroughly mixed by shaking or by the use of a pipette. Following this the mixture is drawn up to the zero mark in a 1 c.c. pipette which has a bore of 3 mm. and which is graduated in hundredths. The pipette is sealed with a small plug of soap by pressing the end of it into a cake of that material. Pipettes are conveniently arranged vertically in a rack. It has been found that readings are more accurate if the pipettes are always of the same bore and preferably of the same make. It is also of importance that the proportions of the blood-citrate mixture be consistent.

Readings of the degree or distance of fall of the sedimenting red cells are taken at the end of the first hour, at the end of the second

hour and at the end of twenty-four hours, and are recorded as whole figures or numbers. The reading at the end of the second hour is really the important one in this method, and there is usually sufficient fall in this time to be readily measurable. Normal healthy individuals have been found to have readings at the end of the second hour of 10 or below. Some consider a reading of 15 or below normal for women. For the purpose of this paper readings of 15 or below have been taken as being normal in both sexes. The readings between 15 and 30 have been grouped as 15+; those 30 to 40 as 30+; those 40 to 50 as 40+, and those 50 and above as 50+. Few of the readings at the end of the second hour were above 60 and the highest reading recorded was 74. Incidentally, 80 per cent of the readings 15 or under were 10 or under. The percentages throughout this paper are approximate.

The total of 635 cases was classified on admission as follows:

Minimal cases	91	or	14	per cent
Moderately advanced cases..	185	"	29	" "
Advanced cases	286	"	45	" "
Suspected cases	15	"	3	" "
Non-pulmonary cases	7	"	1	" "
Non-tuberculous cases	51	"	8	" "
	635	"	100	" "

It will be noted that almost half, 45 per cent, were advanced cases, while only 14 per cent were minimal.

Those cases diagnosed minimal, moderately advanced, or advanced pulmonary tuberculosis, if arranged in relation to their respective sedimentation rates on admission, result in the following Table, which in substance shows that in the great majority the sedimentation rate has been found to correspond directly with the extent of the active disease, that is, the more extensive or advanced the active disease, the faster the sedimentation.

SEDIMENTATION ON ADMISSION

	Normal		15+		30+		40+		50+	
	No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%
Extent of disease on admission										
Minimal.....	73	80	12	13	4	5	1	1	1	1
Mod. advanced	87	47	53	29	24	13	17	9	4	2
Advanced.....	36	13	66	23	75	26	49	17	60	21
Suspected cases	8	54	2	14	4	26	1	6	0	

Of the 15 suspected cases of pulmonary tuberculosis 54 per cent showed a normal sedimentation on admission. In these a definite diagnosis of pulmonary tuberculosis could not be made, but the symptoms and signs were suggestive.

All those above normal presented a condition of pleurisy with effusion, except one which had as a complication renal tuberculosis. On discharge, all were normal except two, one being the renal tuberculosis case. Subsequently a tuberculous kidney was removed from this patient. The post-operative sedimentation readings were not obtained. It is well known that pleurisy with effusion, especially recent, gives rise to an increased rate of sedimentation.

The 7 non-pulmonary cases were diagnosed on admission as follows: tuberculous peritonitis, tuberculous colitis (2), tuberculous adenitis, tuberculous epididymitis, tuberculous bladder (post-operative nephrectomy case), and chronic arthritis, possibly tuberculous. All showed a normal sedimentation on admission, except the case of tuberculous peritonitis, which was 24 at the end of the second hour, and normal on discharge.

Of the 51 non-tuberculous cases 70 per cent, or 35, had a normal sedimentation on admission; 22 per cent, or 11, were 15+; 8 per cent, or 4 cases, were 50+. The history of the 4 non-tuberculous cases with a sedimentation of 50+ is of interest. In one case the diagnosis was syphilis and the patient was put under treatment and discharged with a reading of 38, the specific treatment to be continued. The last follow-up record reported "Improved, working." Syphilis gives an increased rate of sedimentation. In passing, it might be said that 2.5 per cent in this series of 635 cases were found to have this disease as determined by the blood Wassermann test. The second case was diagnosed hypernephroma with metastases in the lung. This patient died three months after admission. The diagnosis was confirmed at autopsy. Malignant new growths give an increased rate of sedimentation, as much tissue destruction occurs in such cases. The third case was diagnosed lung abscess. Artificial pneumothorax was tried, the sedimentation dropped to 46, but acute empyema developed. This patient died four months after admission. The diagnosis in the fourth case was chronic empyema and bronchiectasis. This patient underwent

thoracoplasty three months after admission, has now been in residence two years, and is improving. The sedimentation rate dropped to 38 after thoracoplasty.

Considerable study has been done to determine the effect that anæmia has on the rate of sedimentation. Some observations have been made in this series of the relation of the hæmoglobin percentage to the sedimentation rate. Sixty-four cases, of which 50 were classified as advanced, of the total of 635 were found to have hæmoglobin percentages under 70.

SEDIMENTATION ON ADMISSION

	Normal	15+	30+	40+	50+
Cases with hæmoglobin under 70% on admission	7	11	7	13	26
Hæmoglobin range.....	48 to 68	40 to 68	35 to 68	38 to 68	40 to 68 1 Case— Hb. 22%

On tabulation of these, it was found that the hæmoglobin percentage varied from 35 to 68, and the sedimentation readings from normal to 50+, 11 per cent being normal. There is apparently no constant relationship between the two. A hæmoglobin percentage of 22 occurred in a patient with advanced pulmonary tuberculosis complicated by hypochromic anæmia. The sedimentation reading in this case was 74, the highest of any recorded in this series of 635 patients. Death occurred seven months after admission, being preceded by a drop in the sedimentation to 65. It would seem, therefore, that unless the anæmia is severe it does not affect the test to any significant degree. This has been the experience of others^{6,9} as well. This assertion was borne out also in the case of an out-patient, a non-tuberculous case, who was treated for severe secondary anæmia, brought about by bouts of rectal bleeding from hæmorrhoids at fairly frequent intervals over a period of about one year. When first seen, his hæmoglobin was 40 per cent, red cell count 3,650,000, and yet the sedimentation reading was only 6 at the end of the second hour.

The effect that artificial pneumothorax has on the rate of sedimentation is readily observed. In those cases in which the collapse is satisfactory a decided decrease in the rate soon becomes evident, but in those in which it is only partially

satisfactory the decrease is not so dramatic. By a satisfactory collapse is meant one in which the diseased area is put at rest and the collapse may be technically total or subtotal; a partially satisfactory collapse is one in which only a portion of the diseased area has been affected.

Taking the sedimentation test as an index of activity, a comparison has been made, over a period of three years, of the effect of artificial pneumothorax as compared with routine treatment in bringing about quiescence. The tabulation shows that of those cases of advanced disease with sedimentation rates from 30 to 60, and in which only routine treatment was used, 35 per cent had normal sedimentation rates on discharge. On the other hand, in those in which artificial pneumothorax was employed the rate became normal in 73 per cent. Apparently the satisfactory pneumothorax is twice as effective in bringing about a cessation of activity as routine treatment.

SEDIMENTATION		
	30 - 60 on admission	Normal on discharge
Advanced cases on routine treatment.....	26	9 35%
Advanced cases on artificial pneumothorax.....	26	19 73%

During the course of treatment by artificial pneumothorax the sedimentation test taken at regular intervals is valuable as an indication of the effectiveness of the therapy, and also as an indication of the activity of any lesion on the opposite side. One may feel justifiable assurance that everything is going well if the sedimentation continues to drop during the course of treatment, otherwise trouble should be looked for.

Of the total of 635 patients, 96, or 15 per cent, died in residence. Two of these had minimal disease on admission. One had a sedimentation rate of 40+ and complications were present in the form of severe tuberculous adenitis and peritonitis; the other had a sedimentation rate of 15+ and the disease was progressive, complicated by tuberculous meningitis in the late stages. Nine were moderately advanced. Two were non-tuberculous cases. Eighty-three, or 86 per cent of those who died, had advanced disease on admission, and at that

time only 2 per cent showed normal sedimentation rates, whereas 88 per cent were over 30, including 42 per cent which were 50+. The tabulation is shown below.

SEDIMENTATION ON ADMISSION OF THOSE WHO SUBSEQUENTLY DIED IN RESIDENCE

Extent of disease on admission	Normal	15+	30+	40+	50+
Minimal.....	0	1	0	1	0
Moderately advanced...	1	3	2	2	1
Advanced....	2 2%	8 10%	24 29%	14 17%	35 42%
Non-tuberculous.....	0	0	0	0	2

A study of the mortality rate in 218 cases of advanced disease with normal or abnormal sedimentation rates gives an interesting comparison.

SEDIMENTATION ON ADMISSION

Advanced Cases	Normal	15+	30+	40+	50+
Living up to time of discharge.	23 92%	37 80%	38 62%	21 58%	16 32%
Died in residence	2 8%	9 20%	23 38%	15 42%	34 68%

The tabulation shows that of those with a normal sedimentation rate on admission, 92 per cent were living up to the time of discharge, and 8 per cent had died in residence. In comparison, of those, at the other extreme, with a rate of 50+ on admission, 32 per cent were living and 68 per cent had died.

That the sedimentation test can be depended upon as an aid to prognosis is further borne out by a consideration of the condition of patients one to five years after leaving the hospital, in relation to the sedimentation reading on discharge.

SEDIMENTATION ON DISCHARGE

Condition 1 to 5 years after discharge	Normal	15+	30+	40+	50+
Improved...	194 89%	34 72%	6 30%	2 22%	0
Unimproved	20 9%	10 21%	9 45%	2 22%	2 40%
Died.....	4 2%	3 7%	5 25%	5 56%	3 60%

It was found that of those with a normal sedimentation rate on discharge 89 per cent reported improvement; some were working; 9 per cent were unimproved; and 2 per cent had died. Of

those with a sedimentation reading of 50+ on discharge, none reported improvement; 40 per cent reported no improvement; and 60 per cent died. Siltzbach,¹⁰ using the Cutler method, found that 97 per cent of those patients showing a normal horizontal-line curve at the time of discharge remained well during the subsequent year, whereas 46 per cent of those patients discharged with a vertical curve died in this same period. It is evident that a patient can be discharged with increased assurance if, along with favourable clinical and radiological findings, he presents a normal sedimentation rate.

SUMMARY AND CONCLUSIONS

The rate of sedimentation of the red blood cells in pulmonary tuberculosis is a reliable indication of the activity of the disease, and, to some degree, of its extent.

It may also indicate the presence of some other organic disease or complication which should demand further investigation.

It is a useful and reliable gauge of the effect of collapse therapy.

A persistently rapid sedimentation rate should be considered of grave significance.

The test is of definite value in estimating a patient's fitness for discharge and in determining prognosis.

I wish to express my thanks to Dr. C. B. Ross for reviewing this paper and for his helpful and valuable criticism.

REFERENCES

1. ALDRED-BROWN, G. R. P. AND MUNRO, J. M. H.: The blood sedimentation rate and the plasma proteins, *The Lancet*, 1934, 1: 1333.
2. CUTLER, J. W.: The practical application of the blood sedimentation test in general medicine, *Am. J. M. Sc.*, 1932, 183: 643.
3. CUTLER, J. W. AND COHEN, L.: The blood sedimentation as a routine procedure in the tuberculosis dispensary, *Am. Rev. of Tuberc.*, 1930, 21: 347.
4. TRAIL, R. R.: Sedimentation rate and ultimate prognosis in tuberculosis, *The Lancet*, 1933, 1: 522.
5. WESTERGREN, A.: The technique of the red cell sedimentation reaction, *Am. Rev. of Tuberc.*, 1926, 14: 94.
6. LINZENMEIER, G.: Rapidity of sedimentation of red blood corpuscles and its practical value, *Münchn. med. Wchnschr.*, 1923, 70: 1243.
7. CUTLER, J.: The graphic method for the blood sedimentation test, *Am. Rev. of Tuberc.*, 1929, 19: 544.
8. MASTEN, A. R.: The erythrocyte sedimentation test, *Am. Rev. of Tuberc.*, 1934, 29: 690.
9. KAMINSKY, J. AND DAVIDSON, D. L.: Observations on the red cell sedimentation test in pulmonary tuberculosis, *Am. Rev. of Tuberc.*, 1932, 26: 282.
10. SILTZBACH, L. C.: The significance of repeated red cell sedimentation rate determination in pulmonary tuberculosis, *Am. Rev. of Tuberc.*, 1934, 29: 673.

THE PHYSICIAN AND MODERN DIETETICS*

By MILTON A. BRIDGES, B.S., M.D., F.A.C.P.,

New York

FEEDING of the sick has undergone marked advances during the past decades. Not long ago diet for the well and ailing was nothing but a procedure governed by rule of thumb, aided by empiricism. Many were the heritages, inaccuracies, and legendary dietetic processes at our disposal at that time. As our investigations progressed, these old stand-bys began to prove worthless, and in some instances what had been considered of specific therapeutic value was found to be actually deleterious. In 1840 it first became recognized that foods possessed nutritive elements. Probably the first major source of aid in this country was the tabulation of these elements in common foods. This was first presented in 1895 in the epochal work of Atwater and Woods, who were responsible for the material contained in the famous Bulletin 28 of the Department of Agriculture of the United States of America. This work has

served as the backbone of the analyses of American foods. From a more popular medical viewpoint, E. A. Locke, of Boston, rendered this material readily available in a modified form to the practitioner, nutritionist and food-conscious patient through his "Food Values", published in 1911.

Lately we have been offered chemical analyses of the same foods. Coincident with this work, information relative to the action of the physical body upon the various foodstuffs and minerals was supplied. Promptly thereafter biochemistry became of clinical importance. For the first time it was possible to determine what was occurring in the body as the result of diet in health and disease. Folin, Myers, Benedict, Van Slyke and others have afforded us most important data with reference to the body's reactions to foods. More elaborate chemical aids have been constantly introduced, with the result that empiricism is being rapidly replaced by scientific knowledge. More recent-

* Read before the Lincoln County Medical Association, St. Catharines, Ont., on December 2, 1935.

ly, the names of Sherman, Eddy and Rose have been intimately associated with the presentation of the scientific data produced by themselves and others. To them are due much credit for the dissemination of accurate information concerning the mineral and caloric values of food products. With due respect to the nationally recognized personages in the field of nutrition, and in spite of their honesty and accuracy, much misapplication of their work has been foisted knowingly and unknowingly, and, it might even be said, with dishonest intent, on the medical public. The result is that many deviations from the original presentations of these workers have been the result of guesses, approximations and unwarranted deductions on the part of self-styled nutritionists.

Today the dietetic management of patients is far too complicated for the physician of several decades ago. It demands a knowledge of physiology, pathology, chemistry, nutrition and psychology, among other prerequisites. No longer can the self-educated nurse-cook be entrusted with the planning of a diet. No longer can gross-hand weighing be utilized in the establishment of diet quantities. The time has arrived when dietetics has become a science wherein the likelihood of error on the part of the nutritionist should be at a minimum, and the only chance of error in the proper application of a dietetic regimen should rest on a faulty diagnosis. The physician, as a rule, is completely unskilled in dietetics. His preliminary training encompasses little or nothing concerning food prescription. At most, he is familiar in a general way with some diet for duodenal ulcer, diabetes or typhoid fever, but very promptly this original knowledge is dissipated and he is forced to depend upon the hospital dietitian. Through the efforts of students of nutrition the physician is realizing that the science of nutrition should be a fundamental asset in the care of the patient.

To properly approach the prescription of a satisfactory diet it is essential that a number of phases be taken into consideration in reference to the individual for whom items of food are to be regulated. A carefully taken dietetic history extending over the previous months should be immediately instituted. An analysis of the patient's habits, idiosyncrasies, likes and dislikes, together with a volumetric and caloric

estimation of several average daily menus, should be included. Casual estimation of the nutritive as well as the non-nutritive factors of such a menu should be ascertained, which means that the carbohydrate, fat, protein, alcohol and water intake per diem, as observed in the past, should be established. Further refinement may be done by grossly estimating the quantity of the various minerals, but this appears to be a questionably advantageous factor, particularly as our knowledge of minerals is exceedingly meagre.

It is important in the analysis of the patient's immediate complaint to determine whether the clinical picture, as presented at the time of the complaint, is a true product of a diseased entity itself, or only indirectly due to this disease. For example, has the patient partaken of sufficient food yielding enough calories to maintain the established body weight, or has the complaint, which might be pains in the stomach, produced an anorexia wherein this caloric intake has been markedly reduced? It is not uncommon to find the sufferer presenting a picture of starvation rather than of organic incapacity to assimilate sufficient calories.

Complete chemical blood analyses are of value not only in establishing the present status of the body as regards food elements but also in supplying information relative to any metabolic defect. Most of the blood substances are subject to marked alteration due to the over- or under-ingestion of various foods. Prior to planning a diet, it can readily be seen that the past dietetic history, combined with chemical blood analyses, must establish certain dietetic demands aside from any presenting pathological condition.

The real work of the nutritionist commences only after the establishment of a specific diagnosis. At this juncture it is essential to review the new dietetic demands which are made in the face of a disturbed physiological state. For example, if the patient is suffering from a duodenal ulcer, and the indicated diet is to be low in acid as well as low in those foods highest in roughage, it is important for the prescriber to take into account the total physiological picture, aside from the specific diagnosis. Such factors as overweight, anaemia, and idiosyncrasies should be considered when the dietetic compilation is made. If a patient for some

reason or other has never been able to take eggs, it is far from good practise (unless the indication is imperative) to force this offending food. Like recognition should be observed in similar instances when the intolerance has been substantiated as being real and not fancied.

Dietetic incompatibilities often arise. Instances are experienced in the management of spastic colitis and chronic cholecystitis, two conditions which are commonly co-existent. The patient suffering with this combination often exhibits a definite fat intolerance which generally makes the institution of a colitis diet of relatively high-fat content impractical. The present-day accepted diet for spastic colitis is one in which roughage is avoided and in which fat is generally high, whereas the generally recognized diet for gallbladder disease is the antithesis thereof. This should be investigated and a practical readjustment should be instituted. In dealing with an overweight patient suffering from colitis it behooves the practitioner to compute a diet of lower caloric value than that routinely prescribed for this condition. In other words, wherever possible, the principle of feeding the patient and not solely the disease should be practised.

The physician is likely to fall into error from misunderstanding or improper application of the armamentarium with which he has been supplied. This is especially true in the establishment of specific diets, the specificity of which may call for a set amount of protein, fat, carbohydrate or some of the mineral substances. For example, lentils are rated as one of the highest iron-bearing food substances available. There can be no question concerning the authenticity of the analysis of the lentil, but, unfortunately, this analysis was done on dried lentil, which is not edible as such. In the course of its preparation as a palatable food the iron content becomes so diminished that it is impractical to consider it as a real iron-bearing factor. In the dried state the carbohydrate content of macaroni, spaghetti, and noodles is exceedingly high, but after these foods are boiled, owing to dilution by water, the carbohydrate value is markedly diminished and exceedingly variable. Another example of a likely misadoption of analytical data may be found in the case of parsley, which has been proved to be an excellent source of vitamin A

and vitamin C. It is very likely that with this information, the practitioner will probably recommend parsley as a valuable vitamin A and C food. When one considers the relatively infinitesimal amount of parsley that a patient usually takes, it can be readily seen that its prescription is little short of ridiculous. Still another illustration of a likely misapplication of analyses concerns cocoa, with particular reference to its copper value. The copper content of cocoa is listed as being next to the highest in all edible foods. Therefore when a food of high copper concentration is desired the recommendation of this item would apparently be indicated. However, when it is realized that the high copper percentage of cocoa was established from the analysis of the dry substance, and when one considers the small amount of cocoa used when it is served as a beverage or used as flavouring, it is evident that the actual amount of copper obtained is negligible.

Errors are likely to enter when it becomes necessary to augment a diet by additional protein. It is well known that gelatin, fish, cheese, white of egg, poultry and meat are the chief sources from which protein is obtained. Gelatin, if the analyses are correct, contains from 90 to 95 per cent of protein. However true this statement may be, it can be seen readily that the giving of crude gelatin as a food is impractical. Therefore, it is generally given in solution which has to be so dilute for palatability as to render the protein content of little value.

The present status of food analyses leaves much to be desired. Very little work has been done since the publishing of Bulletin 28, previously referred to, in the way of furnishing additional analyses of percentage compositions of carbohydrates, fats and proteins of the common foods. A review of the various food analytical tables available at the present writing reveals nothing but an alteration or readaptation of the material contained in that bulletin, with the result that the inaccuracies and alterations have been so extreme as to render the source unrecognizable.

Strangely, the majority of food analyses determined to date have been on the raw product, with the result that figures are absent for the most commonplace foods in the edible cooked state. Naturally, this insufficiency of data

renders accurate dietetic computation impossible. Strange to relate, this discrepancy is commonly overlooked, with the result that patients are charged calorically with values derived only from the analyses of raw food items. This insufficiency of data is most evident in the instances of meat and fish. The mineral analyses have shown more promise, and a wealth of material, much of which is inaccurate, has been produced from a great number of sources. At present, we need further investigation of the nutritional and mineral analyses of cooked foods.

During the past several decades the public has come to use canned and packaged foods. From the dietetic standpoint, strange as it may seem, little recognition has been taken of these products, and the analyses of the same have heretofore been unavailable to the practitioner without correspondence with the manufacturer. Hence, it behooves us to have readily available the analyses of these products in conjunction with the analyses of common foods. The use of commercial foods has so far infiltrated into the daily menu of the public that to preserve the old attitude of insisting upon fresh and non-commercial products is archaic. With due respect to commercialism and the honest intent of the majority of food manufacturers, the percentage of dishonest propaganda is too alarmingly apparent. An unscrupulous minority preys upon the vanities and current fads of the population as a whole, with their force mainly directed at the female sex.

Much propaganda is being issued in reference to vitamins. Commercial interests are even sponsoring foods synthetically impregnated therewith. If we were to believe the literature with which we are deluged our mental equilibrium would be in a constant state of turmoil. Failure to take this or that vitamin as advised by the commercial interests would appear to make us guilty of self-destruction.

Vitamin A, a normal constituent of many fats, exhibits its deficiency by xerophthalmia, night-blindness, questionable calculus formation in man, and retardation of growth and development in young animals. Deficiency of vitamins B, B₁ or F, found among the meats, particularly pork, as well as oysters and other seafood, produces an anorexia, neuritis, amenorrhœa in the female, and several other indeter-

minate symptoms. There should be little danger of marked vitamin B deficiency, except when the diet is limited solely to artificially refined foods. Vitamin C, contained in the citrus fruits, parsley, red and green peppers, new cabbage, and tomato juice, exhibits its deficiency in the historical disease, scurvy. Vitamin B₂ or G, normally found in milk and milk products, when deficient, appears to be associated with dermatitis and alopecia. Vitamin D, a normal constituent of a large number of sea-foods, butter, cream and egg-yolk, when deficient, seems to affect bone metabolism, either directly or through some undetermined effect upon calcium metabolism. Vitamin E, plentiful in leafy vegetables, legumes, wheat germ and meat, serves an indeterminate function, but its deficiency appears to be definitely associated with ovulation and sterility. Needless to say, in spite of all the fore-going, it has been universally proved that any well-balanced diet contains adequate vitamins of all types to forestall any diseases traceable to vitamin deficiency. The same attitude may be assumed with safety in reference to minerals.

Another confusing piece of propaganda has been built around the term "acidosis". This unoffending word has given birth to myriads of definitions. Anything from acid mouth to acidity of the urine has at one time or another been called "acidosis". In combating this apparently dread disease, which, incidentally, is nothing but a symptom, foods have been maliciously mis-classed and incorrectly prescribed. Were we to believe both the moderately remote and most recent advertising propaganda anent alkalization and alkaline waters, our acid stomachs, acid bloods, acid urines, and acidoses would be a matter of most trivial significance. The unfortunate objection to these products on the part of the medical profession is that none of them contain sufficient of the reported elements to be of any practical therapeutic value without the human being imitating the well-known camel.

Still another much-abused term is "protein". It had become a fetish among the public, and, incidentally, among many of the profession, empirically to prescribe a low protein diet for the person beyond middle life. It seemed well understood and agreed that red meats, eggs, cheese, poultry and fish were not well tolerated

by the elderly. As a result, the physician finds in his practice today, a large number of patients in later life who are suffering from nutritional anæmia because of the adherence to this heritage. In these cases it is the rule to find a sub-normal blood urea nitrogen which is pathognomonic of protein deprivation. As a matter of fact, recent investigations have revealed that the daily protein intake of the average individual is only 45 to 50 grams. Consequently, in view of the fact that the current recommended requirement per diem is 75 grams per 150 pounds to replace the daily protein waste, it must be evident that the actual facts do not confirm the statement that the average person eats too much protein.

Further propaganda extols the claims of diets predominating in vegetables. In these instances it is assumed that the normal protein requirement is supplied, in the main, by vegetables and nuts. Obviously, to obtain the requisite amount of protein from these items makes it necessary for the total vegetable and nut ingestion to be beyond the average volumetric capacity of a normal person. Vegetarianism, in spite of its wide-spread acclamation and devoted followers, presents an inexplicable inconsistency. Its principles forbid meat protein, but they incorporate most lavishly, milk, eggs and cheese, all animal products as much as the flesh of the animal.

Much interest is being shown by the laity and some of the profession in a so-called protein-starch regimen. We are constantly hearing that starches and proteins should not be taken at the same meal. It is asserted that the two items are incompatible when ingested at the same time. The principle of this diet is physiologically unsound and may be capable of doing actual harm to those who follow it. This unphysiological proposal is most aptly controverted by the very preachings of its chief endorser. Milk and vegetables are allowed at the same or different times. It takes but the simplest mind, medical or otherwise, to promptly realize that the starch and protein components in these two items of food are inseparable.

As a result of the advances in the several fields of nutrition many of the empiricisms of

the past have been refuted. The great strength-giving qualities of broth have been proved to be a myth. Red meat, in contradistinction to well-done meat, has likewise been found to be a differentiation without a nutritional difference. The white meat of chicken as a food for the invalid, aside from its possible pleasing appearance, has acquired a successful competitor in the dark meat from the same fowl.

We have been incessantly "ballyhooed" by the claims of this or that type of coffee. We are constantly being confused by the health-giving or detrimental features contained in stale, fresh, or decaffeinated coffees, or coffee substitutes. The advertising propaganda in reference to these products seems to be directed essentially at that terrible offending alkaloid—caffeine. Little cognizance is taken of the other elements contained in coffee, whether stale, fresh or decaffeinated. From the gastroenterological viewpoint it is not felt that caffeine is the major factor in the production of detrimental effects from the use of coffee, but that the other elements contained in the coffee beverage are the culprits.

Even common table salt has been accorded prominence by the production of numerous salt substitutes, the majority of which still contain the harmful sodium radical in combination with some radical, other than chlorine.

Many ambitious self-styled investigators, looking for a place in the sun, are constantly formulating weird, impractical and often harmful catch-title regimens. In rebuttal to any newly proposed diet, the application of an attempted hypothesis herewith presented, should be applied:

The proper attitude to assume in reference to any newly-developed diet is to check its principles against sound, known physiological demands. When these are met by any new regimen, and when such things as palatability and avoidance of monotony are accomplished, together with successful demonstration of clinical response under competent observation, then such a dietary is worthy of commendation and institution.

OBSERVATION ON THE USE OF IRON PREPARATIONS IN THE TREATMENT OF ANÆMIA

BY JOHN T. TWEDDELL, M.D., C.M.,

Queen's University,

Kingston

THE treatment of the hypochromic anæmias with various iron salts has in recent years received much attention and the preparations of iron salts offered on the market are many and varied.

Starkenstein and Weden¹ suggest that the potency of an iron preparation depends upon the liberation of ferric ions following the action of gastric and intestinal secretions, hence the most ideal iron salts should be the sulphate, carbonate or chloride. The percentage of ferrous ions liberated from an iron salt must be considered when the various preparations are used. Iron and ammonium citrate is very low in this respect, while ferrous sulphate and ferric chloride are ideal. Heath² has found that iron and ammonium citrate and ferrous carbonate offer the same low percentage of iron utilization. He also states that Pil. Ferri in 15 grain doses gives a higher percentage utilization of iron than do the optimal doses of 45 grains, suggesting that the smaller doses are more readily absorbed. The apparent differences which exist between the optimal doses of the various iron preparations possibly depend on the degree of solubility, ionization and absorption of the preparation.

This report contains in brief the results obtained with the use of four well known iron preparations in cases of hypochromic anæmia. Forty patients were treated. The primary disease present in the series varied, some being cases of carcinoma, others nutritional anæmias, anæmias of pregnancy, and anæmias due to blood loss of small amount over a long period of time. An attempt was made to group the cases so that at least one case of each type fell into one of the four groups.

The forms of iron used were as follows.

1. *Ferrous sulphate*.—This drug was used in tablet form, each tablet containing $3\frac{1}{2}$ grains of ferrous sulphate and $3\frac{1}{2}$ grains of concentrated vitamin B₁ and B₂. The dosage was

2 tablets 3 times daily after food. The results were very encouraging, and while the end-results were no more outstanding than with the other iron preparations, certain points were of note, to wit: (1) the response to treatment was apparent somewhat earlier than with the other preparations; (2) there was no complaint of gastric upset; (3) constipation and diarrhœa were absent, and there was no complaint of abdominal cramps.

2. *Reduced iron*.—This drug was given in massive doses of 45 grains daily. Smaller dosage was inadequate. Under massive dosage the patients complained, with great enough frequency to warrant consideration, of either constipation, diarrhœa, or gastric upset.

3. *Iron and ammonium citrate*.—The results with this drug were comparable to those with reduced iron. For the first two days during which the drug was given, 40 grains a day was the dosage, and if well tolerated this was increased to 90 grains daily. The patients who responded to this drug did so very rapidly but there were several cases in which no response was obtained. Further objections to this form of iron were gastric upset and staining of the teeth.

4. *Blaud's pill*.—Fresh supplies of the preparation were used. It was found that a dosage of 45 grains per day was the optimal dose. Smaller dosage failed to give a good response. The main objection to this preparation was on the part of the patients, and they complained of the large bulk of the tablet.

The results in tabular form, as shown on page 665, were of interest.

SUMMARY

In considering ferrous sulphate, reduced iron, iron and ammonium citrate, and Blaud's pill, as to their respective merits in the treatment of anæmia, it would appear that each appears of equal efficiency if given in adequate doses.

TABLE
FERROUS SULPHATE WITH VITAMIN B₁ AND B₂

Case	Diagnosis	Daily dosage	R.B.C. & Hgb. at start	R.B.C. & Hgb. 1 week	R.B.C. & Hgb. 2 weeks	R.B.C. & Hgb. 3 weeks
		grains				
1	Malignancy.....	21	4,730,000—71%	4,870,000—78%	4,970,000—85%	5,000,000—90%
2	".....	14	4,000,000—65%	4,100,000—66%	4,770,000—78%	4,900,000—90%
3	".....	21	4,550,000—74%	4,270,000—65%	3,570,000—63%	3,250,000—55%
4	Anæmia of pregnancy..	21	4,200,000—70%	4,180,000—81%	4,500,000—85%	5,000,000—92%
5	Nutritional anæmia...	21	4,320,000—80%	4,860,000—75%	4,980,000—85%	4,990,000—85%
6	Malignancy.....	21	4,110,000—55%	4,500,000—65%	4,800,000—70%	4,950,000—80%
7	Nutritional anæmia...	21	3,900,000—50%	4,770,000—65%	4,900,000—70%	5,420,000—98%
8	".....	14	4,000,000—54%	4,000,000—80%	4,800,000—80%	4,850,000—88%
9	Malignancy...	14	3,620,000—50%	3,900,000—70%	3,500,000—50%	4,000,000—69%
10	Hæmorrhoids...	21	3,800,000—55%	4,500,000—75%	4,950,000—80%	5,100,000—85%

REDUCED IRON

1	Anæmia of pregnancy..	45	3,420,000—60%	4,000,000—65%	4,350,000—70%	5,100,000—82%
2	Nutritional anæmia...	45	3,400,000—62%	4,000,000—70%	4,500,000—80%	5,000,000—88%
3	".....	45	4,000,000—70%	4,200,000—72%	4,800,000—84%	5,150,000—92%
4	Anæmia of pregnancy..	30	3,950,000—65%	4,100,000—70%	4,250,000—75%	4,400,000—78%
5	Malignancy.....	45	3,800,000—68%	3,950,000—70%	3,950,000—70%	3,450,000—68%
6	".....	30	4,200,000—71%	4,000,000—73%	3,850,000—70%	3,660,000—65%
7	".....	45	4,000,000—70%	4,050,000—72%	4,000,000—70%	4,100,000—75%
8	Hæmorrhoids.....	45	4,150,000—70%	4,400,000—80%	5,000,000—85%	5,000,000—90%

IRON AND AMMONIUM CITRATE

1	Malignancy..	50	3,420,000—70%	3,900,000—74%	4,230,000—82%	4,800,000—86%
2	".....	40	3,200,000—43%	3,160,000—39%	3,800,000—50%	4,350,000—65%
3	Hæmorrhoids.....	90	3,700,000—50%	4,000,000—58%	4,200,000—60%	4,500,000—72%
4	Anæmia of pregnancy..	90	3,500,000—50%	4,100,000—65%	4,500,000—75%	5,000,000—90%
5	".....	90	4,000,000—68%	4,250,000—70%	4,400,000—74%	4,800,000—80%
6	Nutritional anæmia...	40	4,100,000—65%	4,325,000—70%	4,325,000—70%	4,400,000—72%
7	Chlorosis.....	90	3,600,000—52%	4,000,000—62%	4,400,000—70%	4,900,000—80%
8	Post partum hæmorrhage	90	3,250,000—45%	4,100,000—65%	4,800,000—76%	4,950,000—84%
9	Malignancy.....	90	3,950,000—58%	3,500,000—54%	3,400,000—54%	3,000,000—40%
10	Nutritional anæmia...	90	4,100,000—62%	4,500,000—70%	4,800,000—78%	5,000,000—85%

BLAUD'S PILL

1	Malignancy.....	45	3,850,000—65%	3,900,000—65%	4,000,000—70%	4,000,000—70%
2	".....	30	3,900,000—68%	3,800,000—60%	3,450,000—58%	3,450,000—55%
3	Nutritional anæmia...	45	3,840,000—68%	4,000,000—72%	4,250,000—74%	4,900,000—80%
4	".....	30	4,000,000—78%	4,500,000—82%	4,700,000—85%	5,000,000—90%
5	".....	30	4,150,000—80%	4,100,000—80%	4,200,000—80%	4,000,000—80%
6	Hæmorrhoids.....	45	4,000,000—76%	4,500,000—80%	5,000,000—86%	5,100,000—90%
7	Anæmia of pregnancy..	45	3,950,000—75%	4,000,000—80%	4,650,000—85%	5,200,000—95%
8	Hæmorrhoids.....	30	3,850,000—65%	4,000,000—70%	4,100,000—70%	4,350,000—74%
9	Malignancy.....	45	4,000,000—70%	4,400,000—76%	4,500,000—75%	4,800,000—80%
10	Hæmorrhoids.....	45	4,125,000—72%	4,600,000—78%	5,000,000—85%	5,000,000—90%

Ferrous sulphate with concentrated vitamin B₁ and B₂ possibly excites an earlier response. Fullerton³ has very truly stated that the question resolves itself into one of cost and convenience. Bland's pill hardens on keeping and is bulky. Iron and ammonium citrate is only fairly well tolerated and stains the teeth. Reduced iron is a "messy" preparation. Ferrous sulphate is less bulky and can be taken in smaller doses and is a very inexpensive form of iron therapy.

Grateful acknowledgment is made to the Petrolagar Laboratories of Canada, who supplied the necessary ferrous sulphate for the above work, under the trade name of "Plastules (Deshell) Plain", and to the Burroughs and Wellcome Company for liberal supplies of reduced iron and Bland pill.

REFERENCES

1. STARKENSTEIN, E. AND WEDEK, H.: Über das Schicksal des Eisens im Organismus nach Zufuhr von komplexen Verbindungen mit anorganisch und organisch gebundenem Eisen, *Arch. Exp. Path. & Pharmac.*, 1930, 153: 354.
2. HEATH, C. W.: Oral administration of iron in hypochromic anemia, *Arch. Int. Med.*, 1933, 51: 459.
3. FULLERTON, H. W.: Treatment of hypochromic anemia with soluble ferrous salts, *Edin. Med. J.*, 1934, 41: 106.

THE RELATION OF BRONCHIECTASIS TO PARANASAL SINUS INFECTION*

BY GEO. E. HODGE,

Montreal

DURING the past fifteen years widespread interest in the relationship of bronchiectasis to paranasal sinus infection has been shown by the numerous articles which have appeared in medical literature, especially in those journals devoted to otolaryngology. This interest has been increased by the stimulating advances made in the fields of bronchoscopy, roentgenology and chest surgery and particularly by our increased knowledge of the reaction of the mucous membranes of the respiratory tract to allergy and to infection. Our knowledge, however, of some of the phases of this relationship is still obscure. A brief résumé of the literature will help to summarize our present views on this subject.

VIEWS ON CAUSAL RELATIONSHIP

As early as 1914 Thomson suggested that a persistent bronchorrhœa might be due to chronic sinus suppuration. Later Sergeant, Rist, Webb and others, noting the presence of sinusitis in patients with pulmonary suppuration, stressed the importance of a thorough examination of all the sinuses in these patients. Mullin found that in almost all his patients with bronchiectasis a co-existing sinusitis occurred. He believed that a primary bronchitis tended to clear up unless it was kept active by a well marked sinus infection.

Peroni, after an extensive investigation of the sinuses in bronchiectasis, concludes that co-existing sinusitis is very often primary. When not so, he believes that the nasal condition is sufficient to augment and protract the disease.

Wasson suggests the term broncho-sinusitis for those infections involving the entire respiratory tract—especially those of a chronic nature. He followed 90 children from birth to eight years of age and believes that, while there is no common etiology, this condition is greatly in-

fluenced by lack of vitamins, by heredity, environment, climate and air contamination.

Opie, in a study of the pathological anatomy of influenza from British and American sources, states that infection of the nasal accessory sinuses appears to be an almost invariable accompaniment of influenzal pneumonia. It is interesting to note also that bronchiectasis has been frequently found as a sequela of influenza. Clerf suggests that bronchiectasis, when associated with sinus infection, is usually bilateral. Adam, on the contrary, believes unilateral bronchiectasis occurs with sinusitis.

An interesting observation has been made by Graham. He noted the frequent occurrence of an acute inflammation of the mucous membranes of bronchial fistulas which took place about twenty-four hours after the onset of an acute sinus infection. With the improvement of the upper respiratory infection he observed that the reaction in the bronchial tissues also cleared up.

FREQUENCY OF RELATIONSHIP

Statistics from various centres have shown the relationship of chronic sinusitis and non-tuberculous bronchiectasis to be extremely common. It has been said to vary from 55 to 100 per cent; Clerf reported 82.4 per cent, Dunham and Skavlem 73 per cent, Quinn and Meyer 58 per cent. In a series of 37 patients at the Montreal General Hospital with bronchiectasis, we found that approximately 75 per cent showed an associated sinusitis. Like the great majority of other authors we found the maxillary sinus most frequently affected.

Just what the frequency of this relationship indicated is still a subject for discussion. Numerous authors insist that sinusitis is the primary cause of bronchiectasis; others suggest the bronchiectasis as primary. The latter has not, however, been proved. In an effort to check this possibility in some ten patients with bronchiectasis, at the General Hospital, I placed

* Presented at the Joint Meeting of the Canadian and American Medical Associations, Atlantic City, Section of Laryngology, Otology and Rhinology, June 13, 1935.

a small amount of lipiodol in the trachea. The patients were postured and asked to cough. In only three patients were traces of lipiodol found by x-ray in the naso-pharynx. Argyrol was also used in a similar number of patients. A few only showed any stain in the naso-pharynx. No lipiodol or argyrol was found in the nose. When coughing, the soft palate seemed a fairly efficient barrier to the entrance of these substances into the naso-pharynx. The majority of writers on this subject believe that the whole respiratory tract is simultaneously affected and that, although the bronchitis and pneumonitis tend to clear up, they are kept active by the constant overflow from infected sinuses.

The various routes by which nasal sinus infection may influence the respiratory tract have been frequently referred to. Davis described the following: (1) by direct extension of the inflammation of the larynx, trachea, and bronchi, or by extension of the infection through the blood and lymphatic streams; (2) by aggravating or increasing an existing lesion of the lungs; (3) the nasal sepsis may be part of the general infection in which both the upper and lower respiratory tracts are involved.

Much has been done experimentally to show the relationship of sinusitis and non-tuberculous bronchiectasis. The work of Mullin and Ryder has been frequently cited. They demonstrated the lymphatic drainage of the maxillary sinuses and their connection with the lungs, and also the inhalation route by which nasal secretions reach the lungs. The work of Pfahler, of Philadelphia, and Le Mee, of Paris, with lipiodol seems to have completely corroborated these earlier experiments. Quinn and Meyer demonstrated lipiodol in the thorax after injecting it into the nostrils of sleeping patients. And McLaurin showed that, after placing lipiodol in the antrum, it could be demonstrated in the chest by x-ray.

These experiments clearly demonstrate that chronic sinusitis must play a very important part in chest infections, and that infection reaches the thorax chiefly by the inhalation and lymphatic routes.

Some criticism of this latter route has been recently shown and there now seems to be a general belief amongst writers that the etiological influence of the sinuses in focal infec-

tion has been over-emphasized. Childrey and Essex have indeed described the sinus mucous membrane as being highly resistant to absorption. Lawson, however, believed that toxæmia, in chronic disease of the sinus membrane, is of great clinical significance and probably originated from absorption of small quantities of highly virulent toxins generated within the sinus cavity. Kistner and Jones have demonstrated streptococci of virulent types from the submucosa of numerous cases of coronary disease. Hurd and Synder believe that sinusitis without evidence of discharge is responsible for many cases of serious arthritis. In a recent interesting article, it has been shown by Tilly that there is frequently a residual infection in the bone tissues of the sinus capsule and that this is one of the most potent foci for the vascular transmissions of septic organisms and their toxins. It is therefore very probable that in this type of case and in the so-called silent cases of sinusitis with little drainage absorption from the sinuses to the lungs is most marked.

The frequent absence of all symptoms of sinus disease when associated with bronchiectasis has been frequently noted, but I do not believe has yet been sufficiently emphasized. Frequently nasal disease, when unaccompanied by pain, is not complained of by the patient, and only a thorough examination will detect the sinus infection. Mullin, in reporting 295 patients, stated that in nearly 7 per cent of these patients cough was the only symptom, although well marked sinus infection was present in all. Frequently also, cases have been reported which have been treated for tuberculosis over a period of years and which have been in reality suffering from sinusitis and bronchiectasis.

What is perhaps a common experience amongst laryngologists has been emphasized by Clerf. Patients complaining only of a chronic cough and husky voice are found, upon laryngeal examination, to have a chronic laryngotracheitis. A thorough physical examination of these patients fails to show any evidence of thoracic disease. Yet an examination of the sinuses and nose reveals a chronic sinusitis. A routine examination of the sinuses then should be made in all patients with infection of the lower respiratory tract. This procedure would

reveal, as many authors have indicated, many unsuspected cases with sinus involvement.

The assumption then is, that, following the sinusitis, a chronic bronchitis develops and, in the course of time—perhaps years, a bronchiectasis. The process by which this occurs is not completely understood and there seem to be many exceptions. Frequently a patient with sinus involvement, even a pansinusitis, with a history of post-nasal discharge and cough for years, is found to have little or no evidence of thoracic disease. Why then does the lung seem so resistant to infection in some patients and succumb so easily in others? The resistance of the individual and the virulence of the organism must of course be taken into consideration. Why also, if this assumption is correct, do chronic sinusitis and bronchiectasis occur in very young children in whom the duration is obviously short. All recent evidence would seem definitely to suggest that some change occurs in childhood which predisposes these patients to subsequent lung infections.

THE INFLUENCE OF ATELECTASIS IN BRONCHIECTASIS

Bronchiectasis has been well described as a disease of childhood. And it is interesting to note, in reported histories, the frequency with which patients with bronchiectasis date their symptoms to early childhood. In recent years authors have described, in children, a triangular shadow at the base of the lung in pulmonary roentgenograms. Singer and Graham were the first in America in 1925 to recognize this shadow as a sign of atelectasis and bronchiectasis of the lower lobe. Anspach has reported a study of fifty of these cases in children. He found that, where this triangular shadow fluctuated in size and density from one examination to the next, only tubular bronchiectasis developed. Or the chest cleared up with little or no evidence of dilatation of the bronchi. When drainage did not occur with frequent re-expansion of the lobe or lobules, saccular bronchiectasis resulted. This latter occurred in the finer more distal bronchi in which thick secretion easily produced complete obstruction. He thinks that allergy may aid in bringing about the initial obstruction by the swelling of the mucous membrane and the production of thick tenacious secretion.

With other writers Anspach believed atelectasis was the precursor of adult bronchiectasis. Very frequently permanent damage occurred in the lung in early infancy and, even though dilatation did not occur, the bronchi were left in a weakened condition. This, he suggested, aided in the development of bronchiectasis with associated clinical symptoms in adult life. The research study by Robinson, of Toronto, who reported on the pathology of 16 lobectomies for bronchiectasis, would seem to corroborate this view.

It is therefore interesting in this connection that, since the advent of pneumonography and the widespread use of lipiodol, various writers have shown that dry bronchiectasis exists, as evidenced by bronchial dilatations. This has been noted in both children and adults. Wall and Hoyle, in citing 30 cases from the literature and reporting 20 of their own cases in two years, concluded that dry bronchiectasis was extremely common and that the great danger lay in the development of a wet bronchiectasis.

INFECTION OF THE TRACT AS A WHOLE

There has been a tendency amongst a number of writers to describe infections of the mucous membrane of the respiratory tract as separate entities instead of as a whole. The reaction of the mucous membrane in infection is much the same, whether in the nose or thorax. It is interesting therefore to find in a foetid bronchiectasis changes in the mucous membrane very similar to those seen in the nose in atrophic rhinitis with ozæna. Both have been attributed to a multitude of bacteria, while numerous theories have been cited in each to describe their etiology. Recent investigation is helping to increase our knowledge of the reaction of the respiratory tract to allergy. Bronchiectasis has been produced in guinea pigs experimentally by vitamin deficiency. And the investigations of Dean and Hetler have shown that vitamin A deficiency will produce sinusitis in monkeys but a vitamin-high, protein-deficient diet will produce both suppurative sinusitis and otitis. While specially planned diets have been shown to be of great value in upper respiratory infection, Dean has emphasized the fact that sinus disease cannot be cured by diet alone. And Fenton has shown experimentally that in well nourished cats special diets will not arrest acute sinusitis, or prevent its development into chronic sinusitis.

The histiocyte system has been found by Fenton and his co-workers to take up early defensive measures in the sinus and ear membrane during acute invasions or acute exacerbation of chronic processes. Plasma cells have been found to the exclusion of histiocytes in all late and chronic stages of inflammation and repair. Sippe, in a recent article, has suggested that hypoglycæmia and ketosis may play a part in both children and adults in chronic antral disease and bronchiectasis. He reports 9 cases, 3 early with complete relief of symptoms, and 6 advanced cases that showed considerable improvement following the administration of glucose. While these results are too small from which to draw any conclusions, he suggests that many of those who develop chronic sinusitis and pulmonary fibrosis have an exudative diathesis as the basis for the development of lesions of the respiratory tract. Frequently this inability to retain water in the tissues is due to an insufficient supply of available glucose as evidenced by hypoglycæmia or ketosis.

While it is still true that there are many exceptions, all our present evidence would tend to show them that a suitable soil is developed in early childhood for subsequent infections of the respiratory tract. A sinusitis, taking part in the involvement of the whole respiratory tract, may date from infancy, the constant overflow of secretion being sufficient to keep the bronchial condition active. Or the sinusitis due to influenza or the infectious diseases occurring in later life finds in the bronchial mucous membrane a soil suitable for the development of bronchiectasis. While some patients with bronchiectasis do not show any evidence of sinusitis, even after the most thorough examination, the possibility that sinus infection might have been present at some time cannot be excluded. In view of our more recent knowledge it is perhaps reasonable to assume that in these patients the sinuses shared the primary infection of the whole respiratory tract. Due to good drainage the upper portion of the tract cleared up, while the extreme degree of pneumonitis present prevented the lower portion from doing so. Considerably more investigation is needed to decide just what part allergy or the question of hypoglycæmia play in sensitizing the whole tract to infection.

TREATMENT

The discussion of the treatment of bronchiectasis is beyond the scope of this paper. There is, however, general agreement that, once bronchial dilatation has occurred, only radical surgery, with unfortunately still a high mortality rate, is successful in curing this condition. And, while operation upon the nasal accessory sinuses will not cure bronchiectasis, any focus should be, where possible, removed before surgical treatment of the lung is instituted.

It is in children that the best results will be obtained from conservative treatment and this should be commenced early. The upper respiratory tract should receive active treatment. This usually means simply relief of mechanical obstruction resulting in free drainage. Bronchoscopic suction, postural treatment and vaccine therapy all have their part. Children with sinusitis, who have frequent attacks of bronchitis and pneumonia, should be regarded as potential cases of bronchiectasis. They should be carefully guarded in so far as climate, diet, air contamination and work are concerned, in order to protect the respiratory tract from further infection.

SUMMARY

1. The association of non-tuberculous bronchiectasis and paranasal infection is extremely common.
2. The pulmonary collapse and pneumonitis, frequently found in early childhood, so weakens the lung structure that a suitable soil for subsequent infection occurs.
3. Bronchiectasis, as evidenced by the number of dry cavities reported in both children and adults, is more frequent than was previously supposed.
4. Sinus infection, associated with bronchiectasis, may date from early childhood or occur as a secondary infection in later life.
5. The treatment of bronchiectasis is surgical. Any focus of infection should be, where possible, removed from the upper respiratory tract before lung surgery is attempted. The best results will be obtained from medical treatment if it be commenced in early childhood.

A list of references can be found in the *Archives of Otolaryngology*, 1935, 22: 544.

SUBCUTANEOUS EMPHYSEMA COMPLICATING TONSILLECTOMY*

By LAUCLIN J. BAKER, M.D.,

Montreal

SUBCUTANEOUS emphysema as a complication of tonsillectomy is not particularly unusual. It is apt to prove rather alarming to the younger otolaryngologist and decidedly disconcerting to the patient. The literature contains relatively few cases, but the condition has occurred in this clinic with sufficient rarity to warrant recording a recent case. A number of cases from the recent literature are introduced for comparison.

CASE REPORT

The patient was a female, aged 27, with a history of many sore throats and colds. Peritonsillar abscess, night sweats, loss of weight and cough were all denied.

The temperature, pulse and respirations on admission were normal. The tonsils were of the submerged type, appearing rather fibrosed. No pus could be elicited on pressure.

The heart sounds were normal; the blood pressure 124/70. Chest: resonant throughout to percussion, and no râles were heard. The remainder of the physical examination was essentially negative. On March 11th the tonsils were enucleated under a general anæsthetic. (Gas induction to intratracheal ether.) Induction was easy. The duration of the operation was 38 minutes. The technique was the modified Sluder method. The bleeding was rather profuse from each side. It was controlled with swabs and pressure. It was necessary to place three No. 0 catgut sutures in the upper, middle and lower thirds of each fossa. The sutures were quite deeply placed, to control the profuse type of bleeding, and the fascia over the superior constrictor muscle was damaged in each fossa.

The patient was seen about one and one-half hours after the operation, when the nurse reported that she was screaming, struggling and coughing. This had occurred while she was coming out of the anæsthetic. She was given a hypodermic of morphia (gr. 1/6), and within ten minutes became quiet and slept for about two hours. The morphia was repeated every three hours for three doses. No hæmorrhage had occurred after the operation. The next morning the patient complained of swelling of her face and neck, and was rather alarmed. Examination revealed a moderate amount of painless swelling extending over the angles of both mandibles and downwards to the clavicle. Palpation showed crepitations over all the swollen areas. Inspection of the pharynx revealed the usual post-operative reaction but no bubbles were seen in the saliva. The lungs were negative on examination.

The second and third days after operation brought no change in the surgical emphysema. The patient did not complain of any pain or discomfort in the swollen regions, but was rather perturbed by the crackling on pressure. The fourth and fifth post-operative days showed a gradual disappearance of the swelling, and on the morning of the sixth day it had entirely gone. Daily lung examinations were negative. The temperature

was within normal limits, except on the second and third days when a slight elevation of 99.2° was present. Daily examination of the pharynx showed only the usual post-operative reaction. There was no œdema of the uvula. Her voice was unchanged. The routine post-operative treatment was carried out, including an ice collar and crushed aspirin, grs. v, before meals. No specific treatment for the emphysema was used. The patient was discharged on the seventh day after operation with no evidence of the emphysema. She was taking a soft diet with no difficulty on discharge.

DISCUSSION

Keen¹ reports a case in a child, admitted thirty hours after tonsillectomy with a history of an acute choking attack and severe collapse. The temperature was 103°; pulse 160; and respirations 60. Subcutaneous emphysema was present over the anterior and posterior aspects of the chest and the lower cervical regions. The throat showed the post-operative findings, and subsequent healing was normal. The lungs revealed no obvious dullness, and auscultation was hindered by the emphysema, but the lungs subsequently were found to be normal. The emphysema was entirely cleared at the end of eleven days. Keen believes that in this case the choking attack was due to some laryngeal irritation such as a blood clot arising in the tonsillar beds. The clot caused obstruction of the glottis, and the violent expiratory efforts led to lung distension and a rupture of one or more alveoli. The air was forced along the hilus to the mediastinum and thence to the cervical regions. Keen quotes three cases of Von Hoff in which the emphysema involved the face and neck, and cleared within three to five days. One case is suggested to have resulted from a ruptured alveolar vesicle, as the patient (a child) struggled and cried. The second case is believed to have had the portal of entry for the air through the tonsillar fossa. It is explained that air may enter through the loose areolar tissue about the great vessels when the fascia of the superior constrictor and buccinator muscles is torn during operation or with sutures. The third patient is considered to have had the air pumped into the parotid gland through Stensen's duct by the ether pump, and

* From the Department of Ear, Nose and Throat of the Montreal General Hospital.

from there diffused. In this case the emphysema first was noted over the parotid area.

Stevenson² gives an instance of the occurrence of surgical emphysema after tonsillectomy. The dissection method with general anæsthesia was used. Six hours after operation the patient complained of bubbles in his saliva. Examination showed subcutaneous emphysema extending from the forehead to the clavicles, with the eyes, cheeks and neck being most swollen. There was no laryngeal œdema and no swelling of the mouth or throat except the usual post-operative findings. The emphysema did not disappear for five days, the forehead being the last region to clear. Stevenson quotes a case of A. S. Woodward³ in which surgical emphysema of the head and neck followed the perforation of the anterior pillar of the fauces by a broken pipe stem. Stevenson concludes that in his case the point of entry of the air was through the muscle fibres of the empty tonsil beds.

MacCready⁴ describes two cases in some detail.

The first was that of a man, aged 65, who had had a tonsillectomy under local anæsthesia. The dissection technique was employed. One hour later a swelling was noted about the left eye. The patient had been coughing hard and was apprehensive. On palpation crackling was found. A sedative was given and the patient cautioned not to cough. Twenty-four hours later the swelling was almost gone and had entirely disappeared in forty-eight hours.

The second case was that of an obese female, of forty-eight years. The tonsils were removed under general anæsthesia, using a Sewall-Davis gag and blunt dissection. The tonsils were large, scarred and adherent. A fair amount of bleeding was controlled by catgut sutures in each fossa. At the end of the operation CO₂ and oxygen were given and the patient went into a spasm and had a terrific expiratory effort with tightly clenched teeth. During this time a marked swelling about the left eye appeared, involving both the upper and lower lids and completely closing the eye. Swelling was also noted on the left side of the neck. Palpation revealed crackling over the swollen areas. The swelling was nearly gone within twenty-four hours and entirely so at the end of forty-eight hours.

MacCready points out that the emphysema developed regardless of the type of anæsthesia,

occurring in the first patient during an attack of coughing, and in the second during the spasm of clenched teeth, plus a violent expiratory effort. In both cases the pharynx was clear and no bubbles were noted in the saliva. MacCready believes that the determining factor was the tremendously increased intrathoracic pressure, and that the emphysema was of alveolar origin.

Dickinson⁵ quotes one case, and believes that all of these complications occur during general anæsthesia.

SUMMARY

1. Surgical emphysema after tonsillectomy is not particularly unusual.
2. It may occur during either general or local anæsthesia, requires no special treatment, and has no serious results.
3. It may be immediate or delayed.
4. It occurs both in adults and in children.
5. It has been reported in cases in which the Sluder technique and the dissection method were employed.
6. The origin of the air may be through the rupture of one or more alveoli, or through the damaged muscle fibres of the tonsillar fossa.
7. The case presented appears to have both of the causative factors, as the tonsillar beds were damaged and the coughing and screaming provided the violent expiratory efforts. No predominating cause seems to have been present, and there apparently was a combination of the two forces.

I wish to acknowledge my thanks to Dr. Geo. E. Hodge for help in preparing this report and to Dr. F. B. MacNaughton for permission to refer to this case.

REFERENCES

1. KEEN, J. A.: Medical and surgical complications of tonsillectomy in childhood, *J. Laryngol. & Otol.*, 1932, 47: 28.
2. STEVENSON, R. S.: Subcutaneous emphysema following tonsillectomy, *J. Laryngol. & Otol.*, 1933, 48: 260.
3. WOODWARD, A. S.: Surgical emphysema, *Brit. M. J.*, 1905, 2: 24.
4. MACCREADY, P. B.: Subcutaneous emphysema following tonsillectomy, *Arch. Otol.*, 1935, 42: 331.
5. DICKINSON, J. C.: Subcutaneous emphysema after tonsillectomy, *Ann. Otol. Rhinol. & Laryngol.*, 1933, 42: 1240.

A SYNTHETIC LIGATURE MATERIAL.—H. J. v. Brandis (*Zentralbl. f. Chir.*, Feb. 15, 1936, p. 372) and also W. König (*ibid.*, p. 377) report satisfactory trials of a new synthetic suture and ligature material. It is described as a polymeric compound of vinyl alcohol, and is a reversible colloid like hæmoglobin or globulin. It is water-soluble and heat-resistant, and the threads are produced at a temperature of 130 to 140° C. under a

pressure of 100 to 150 atmospheres. The tensile strength is equal or superior to that of catgut. The special advantages claimed for it are its unquestionable sterility and its lack of irritative or poisonous properties. It is not absorbed in the tissues. The authors have used the material in abdominal, brain, joint, kidney, and hernia operations, but Brandis prefers to retain catgut for gastro-intestinal suture and anastomoses.—*Abstr. in Brit. M. J.*

CANCER: AN EFFECTIVE OFFENSIVE*

(THE EVOLUTION OF SASKATCHEWAN'S ANTI-CANCER CAMPAIGN),

By E. E. SHEPLEY, M.B., F.A.C.R.,

Radiotherapist for the Saskatchewan Cancer Commission,

Saskatoon, Sask.

IN the unfavourable situation which cancer statistics annually portray throughout America, legitimate reason is to be found for advancing a further plea on behalf of more effective offensive measures.

We find that the cancer death rate in the United States in 1921 was 85.6 and accounted for 76,274 cancer deaths. Twelve years later, in 1933, the rate is seen to have risen to 102.2, and 128,479 lives were exacted. In Canada, in 1921, the death rate because of cancer was 72, and there were 4,826 cancer deaths. In 1933 the rate was 100 and the total deaths numbered 10,653.

In the two countries in 1921 there were 81,100 deaths; in 1933, cancer claimed 139,132 lives. In this one sees that not only has the cancer rate shown a consistent annual increase, but, further, in the short period of thirteen years there has been an increase in the sacrifice to cancer of some 58,032 lives. A critical analysis of the data available in this regard by no means satisfactorily explains this situation as being entirely due to better diagnosis or to an increased age incidence, as is sometimes urged.

The dominant position which cancer commands in exacting human life is visualized in the accompanying Table.

In our Province (Saskatchewan), we look upon the statistical situation in relation to pulmonary tuberculosis and cancer with pride.

In the case of tuberculosis, thanks to vision, efficient organization, sound educational endeavour and ample provision for free centralized diagnostic and therapeutic clinics, very definite accomplishment has been registered. It is noted that the pulmonary tuberculosis rate dropped from 43 in 1921 to 29 in 1932. In this splendid attainment a more favourable situation is not to be found in America.

As pertaining to cancer, it may be advanced that Saskatchewan's present low rate is largely due to a favourable age incidence. In 1921 the cancer rate was 39; in 1932 the rate is noted as having risen to 61. While the 1932 rate is, comparatively, still quite low, the annual increase in the rate has excited apprehension, and, in consequence during the past five years

TABLE I
THE TEN MOST FREQUENT CAUSES OF DEATH
(Canadian Vital Statistics, 1932)

<i>Disease condition</i>	<i>Total deaths</i>	<i>Rate per 100,000</i>
Heart disease	15,320	146
Cancer	10,014	95
Diseases of early infancy	7,923	76
Infectious diseases	8,467	82
Pneumonia	7,024	67
Arterial disease	6,800	65
Violent deaths	6,629	63
Pulmonary tuberculosis	5,836	56
Nephritis	5,531	54
Influenza	4,220	40
Enteritis	3,734	36

Saskatchewan has been striving to arrange a type of anti-cancer program which will permit us to maintain more effective control over the situation.

How can we most successfully control the menace which cancer constantly brings into our social and economic life?

Accumulating testimony would appear to suggest that the profession is not satisfied with present levels of attainment, and it is quite inconceivable that either the actual or the potential victim of cancer can find consolation in existing programs, or in present average accomplishment, for by no means do they represent potential attainment. In an endeavour to place the question, that of initiating a more effective offensive above that of purest theory or personal viewpoint, it is conceivable that a study of a hypothetical situation might assist us. In such, let us entirely draw upon that

* A paper read at the conjoint meeting of the American and Canadian Medical Associations, in Atlantic City, June 13, 1935.

intensively accumulated experience and direction which constantly emanates from the world's outstanding cancer centres, and which is already a matter of definite record.

The findings of an expert committee, which supposedly has been invited to prepare an answer to the problem of making provision for efficient organization, conceivably might be briefly listed as follows:

1. The situation in relation to cancer is now of such nature that the exhibition of more effective offensive measures becomes imperative.

2. In that cancer, primarily, is always a definitely local condition, and in that its first appearance is frequently antedated by a site of chronic irritation which lends itself to successful treatment, it may be said, with much truth, that cancer is both preventable and curable.

3. In that the initial primary growth, however small and insignificant in appearance, lacking early recognition and adequate treatment, invariably extends and terminates in exacting the life of the victim, the necessity for providing an adequate anti-cancer program becomes clearly comprehensible.

4. In so far as is practical provision for the prevention of malignancy must be provided. In this, provision for the recognition and the eradication of all accessible pre-malignant states becomes a primary necessity. Further, it is obligatory that malignancy should be diagnosed at the very earliest possible stage of its evolution, and that treatment should be instituted at once. Also, pertaining to treatment measures, it is necessary that these should be of such nature as to ever surround the patient with every possible safeguard.

5. Research measures, in relation to cancer's etiology and how most effectively to utilize all available therapeutic measures, must, of necessity, ever be advanced.

6. The adequate fulfilment of the basic necessities in organization becomes a practical consideration in the measure that we are prepared to squarely face all the facts in the situation. We must most meticulously assay and adequately appraise our total resources and liabilities, and, finally, we must be prepared to meet the indications which are thus revealed.

7. Definite progress in the direction of cancer conquest, a comprehensive goal, becomes

feasible in the measure that the profession and the potential or the actual victim of cancer unite in sharing a common viewpoint in relation to etiology, prevention, early recognition and adequate treatment. Prof. James Ewing has said that in the full and efficient application of present knowledge cancer deaths could be reduced to one-third the present proportions. Unwarranted pessimism and misconception have too long been permitted to becloud our vision and thus to forbid greatest attainment. In this we find, in part, explanation for continued adherence to time-tattered conceptions, traditional tendencies, discredited practices, and discarded theories, all of which forbid higher levels of attainment. Only in the institution of an adequate educational program does it become possible to harmonize present conflicting viewpoints.

8. An educational program must be of such nature that it will definitely assist the general profession to acquire a more practical and a more thoroughly modernized viewpoint in relation to the prevention of and the earliest possible recognition of malignancy. Further, the necessity for at once instituting early and thoroughly efficient treatment must become definitely established. In this it is of vital moment to recall that it is the general practitioner who, in large percentage incidence, makes the first contact with situations which suggest the possibility of malignancy. Thus, the general practitioner is one of the most important factors in a program which avows, as its objective, cancer conquest. Also, the public must be made to become practically familiar with the simple fundamentals which suggest the possibility of cancer and also with those indications which point to the necessity for securing expert opinion. Only in an adequate educational endeavour does this become possible. The practical suggestion, that of instituting periodic health examinations, should be made to become an unquestioned routine.

9. In the treatment of cancer, accumulated experience has definitely served to accentuate the necessity for intensively accumulated skill and experience; also for the adequate correlation of all helpful therapeutic agencies. This only becomes possible in centralized diagnostic and therapeutic cancer clinics. In no other way are the essential facilities made practically

available. Adequate treatment cannot be said to consist of other than the most skilful and thoroughly coordinated association of all helpful measures.

Occasional adventures in the field of cancer surgery and radiotherapy not only prohibit a maximal measure of therapeutic attainment, but, further, such excursions serve to definitely discredit otherwise worthy procedures. In no sense does the excision of a malignant tumour, the exhibition of x-rays, or the application of radium constitute cancer surgery on the one hand or radiotherapy on the other. The extensive nature of their experience, skill and accomplishment alone should serve in designating cancer surgeons and radiotherapists. Forssell has given practical point in this in the quotation "The nature of the primary attack determines the final issue".

10. The possibilities that lie in adequate surgery have long since been established. They are perfectly comprehensible and quite possibly will never be exceeded. On the one hand they are defined by the skill and experience of the surgeon; on the other hand they become circumscribed because of the necessities which anatomical considerations impose as insuperable barriers.

In recent years the scope of radiotherapeutic accomplishment has rapidly extended and already radiotherapy is preferred in many sites. In that the field of its potentiality has by no means been defined, research must ever be advanced in an attempt to disclose inherent virtue which may still lie undisclosed. To radiotherapists and to surgeons is given an opportunity, through cooperation, to raise the present therapeutic accomplishment to a much higher plane.

11. Admittedly, the gulf which lies between average and potential therapeutic accomplishment is formidable, but by no means do the difficulties forbid the bridging of this impediment. In the field of breast and uterine cancer in America there were 12,940 deaths in 1932. It is a matter of record that average accomplishment provides favourable five-year end-results in less than 20 per cent of all operable cases in these fields. Under more ideal situations there is dependable authority for the viewpoint that these end-results could be raised fourfold. In this tremendously increased ac-

complishment there is involved the thorough application of but a few very simple principles. In many other sites, through organized effort, improved end-results are similarly to be obtained.

12. To medical schools is given an exceptional opportunity, that of establishing the ideals and the essential scientific knowledge which alone can make for improved attainment. In the adoption of more complete uniformity in our system of medical instruction our teaching schools would thus be enabled to provide one of the most tangible assets in the field of cancer endeavour, uniformity in conception and in procedure. Unfortunately, by no means do recent graduates in medicine uniformly evidence such teaching, and the greatest variety in viewpoint is to be found in the profession in general. In such variety of individualistic viewpoints there is ever to be found an impediment to progress.

13. In that we now recognize that cancer, in no small degree, is preventable, that the practical attainment of earlier diagnoses is feasible, that ignorance, fear and dilatory attitudes, all capable of correction, largely contribute in providing fatal misdirection and the terminal disaster which so frequently occurs, it is essential that the elimination of these disastrous situations should be established as a much more practical objective in our departments of public health.

14. In the wealth of medical literature, in relation to cancer, there is great virtue; in the complexity of the viewpoints which are constantly advanced great weakness is manifest. A uniform type of practical literature made constantly available to the general practitioner, assessed by capable and experienced workers, would prove of inestimable value. This becomes a practical consideration in the measure that a centralized directing body, selected solely and entirely because of their special knowledge, enthusiasm, and intensive experience in the practical field of cancer, constantly functioned in attempting to maintain uniformity in thought and procedure.

In Saskatchewan an endeavour to evolve a more effective offensive movement is in process of evolution. But five years ago, a cancer committee, the first of its kind in the Province, was appointed by the Saskatchewan Medical Asso-

ciation. At the same time the Association invited the Canadian Medical Association to undertake to provide a national cancer organization. In this it is gratifying to be enabled to state that not only was this the preliminary step in the direction of a Dominion anti-cancer organization, but, further, already much has been accomplished.

One year later (1931) a plan of organization, which involved the principles in anti-cancer organization and to which reference has just been made, was prepared and widely circulated for criticism. Amongst others, Forssell, of Stockholm, Regaud, of Paris, Lord Moynihan, of Leeds, Ewing, of New York, Kelly, of Baltimore, Pfahler, of Philadelphia, Rankin, for the Mayo Clinic, and Capt. Chapman, for the British Empire Campaign, graciously forwarded their viewpoints. In that these men, all outstanding in the field of cancer endeavour, registered an entirely uniform type of endorsement and encouragement, the assumption that these organization principles were basically sound was accepted as established. In further substantiation, in the same year the Radiological Section of the Canadian Medical Association unanimously endorsed them. Further, a resolution was passed and forwarded to the Council of the Canadian Medical Association again stressing the necessity for a National Cancer Organization. Significantly, the most admirable principles of organization, those which have been outlined by Prof. Gosta Forssell, and by Prof. Regaud, were particularly cited and recommended as an ideal source of direction in such an undertaking.

In full knowledge of these principles, and in complete sympathy with the conception of more fully safeguarding the interest of the cancer victim, to its credit, our Provincial Government, through the Department of Public Health, set up a cancer commission, undertook the purchase of radium, established an emanation plant, arranged for other essential facilities, and opened two centralized Cancer Clinics. The first Clinic opened in December, 1931, and the second a few weeks later. Since that date these Clinics have continued to function and have gradually accumulated a most valuable experience in relation to the necessities of organization and how better to serve the victim of cancer.

No experienced cancer worker will visualize in this brief period of activity an experience of unparalleled success, or will conjure up the picture of an altogether triumphal march, in as much as it is a matter of unfortunate experience that the factors which combine to retard progress not infrequently appear infinite in both number and variety. Let not the impression be entertained however, that the undertaking, because of the difficulties and the limitations which have been imposed and which have served to prohibit a greater measure of accomplishment, is viewed as a forlorn hope. On the contrary, the impediments which have been faced have but served to quicken interest and to intensify the determination to eliminate the present handicaps. As an example, the Cancer Committee of our Saskatchewan Medical Association very recently exemplified its faith in its endeavours by restating its position in relation to organization. In this the necessity for the closest possible adherence to those fundamental principles which had been initially advanced were stressed. In a review of this memorandum, Prof. James Ewing stated that in his opinion it was quite the most efficient plan of organization that he had seen. This has proved most heartening. In a recent public address on the subject of cancer organization, the Minister of Public Health (Hon. Dr. Uhrich), and its is under this particular jurisdiction that the present clinics function, fittingly described the situation when he said "In our present experience, we are now permitted to recognize weaknesses and defects and to prepare a more effective organized plan of attack."

From outside the province, it has been gratifying to find that Saskatchewan's program has attracted nation-wide attention and careful study, as is seen in the fact that the Departments of Public Health in practically every Province in the Dominion, after studying it, have not only endorsed the principles involved but have expressed their endorsement of a plan to establish a unified system of Dominion anti-cancer organization.

That interest in initiating and in advancing an anti-cancer offensive is not solely limited to the medical profession is found in the observation already made by many of Saskatchewan's most outstanding educationalists, to the effect that the simple basic facts in relation to cancer

might well be taught throughout the Province's educational institutions. In this suggestion, that of attempting to establish a sane but adequate cancer-consciousness in the mind of the rising generation, beyond question there is the greatest virtue. That the allied professions may be of the greatest service in advancing such an undertaking, Saskatchewan has found

in the practical activities which both the dental and the nursing profession have already initiated in this regard.

It is gratifying to be enabled to briefly recite these facts derived from Saskatchewan's limited experience in attempting to establish a more effective offensive in the field of cancer endeavour.

Clinical Conferences

RECURRENT PULMONARY ŒDEMA WITH CEREBRAL LESION*

By LEWELLYS F. BARKER, M.D.,

Baltimore, Md.

The vascular accidents that may occur in the course of chronic arterial hypertension afford interesting opportunity for clinical and pathological studies. The patient presented today has had recurring attacks of acute pulmonary Œdema during the past few years, and very recently has suffered a severe cerebral insult due to a vascular lesion in the left half of the brain.

CLINICAL HISTORY

This 66-year old coloured woman, was admitted to the Johns Hopkins Hospital (Medical Service of Prof. Warfield T. Longcope) on December 29, 1935, just one month ago.

Past history.—For some 15 years the patient has complained of ringing in the ears, headaches and dizziness. Nine years ago she began to be troubled with cough, and states that she bled repeatedly from the nose; in the following year she began to have attacks of shortness of breath during the night, and about five years ago began to have some precordial pain.

In January, 1932, she had a sudden attack of shortness of breath after climbing a short flight of stairs and produced frothy pink sputum. She was taken to the accident room of this hospital where venesection was promptly done for relief. She was admitted to the ward, where she remained about a month. The study revealed a marked arterial hypertension (systolic pressure 230; diastolic 135), in association with marked arteriosclerosis, enlargement of the heart, myocardial insufficiency (with pulmonary Œdema, passive congestion of the liver, and Œdema of the ankles), and nephropathy, with albumin and casts in the urine. The Wassermann test was negative. There was a slight secondary anæmia (hæmoglobin 70 per cent). After the venesection, under a régime of rest, restricted diet, and the administration of digitalis, the patient improved steadily, though the blood pressure remained at the same high level.

Early in 1934, the patient was re-admitted to the hospital because of another attack of acute pulmonary Œdema. After removal of 500 c.c. of blood from a vein, she was treated as before and made a similar improvement, though during the convalescence she had one mild

generalized convulsive seizure. Her blood pressure was 220 systolic; 115 diastolic. After a three-weeks' stay in the ward she was discharged, being told to continue digitalis therapy and to report regularly to the medical out-patient department, directions that, however, she failed to follow. In July of the same year she again appeared in the accident room of the hospital in a third attack of acute pulmonary Œdema. Owing to the pallor of her mucous membranes it was thought best not to bleed her, but she responded well to morphine and atropine, together with temporary constriction of all four extremities. She was kept in the ward for some five weeks. On admission at that time her blood pressure had fallen to 150 systolic, 85 diastolic; her pulse rate was 120, and her respiratory rate 44. Under rest and digitalis she rapidly improved. Before she left the hospital four infected teeth were removed.

In mid-October, 1935, she re-appeared in the accident room in her fourth attack of acute pulmonary Œdema. After venesection, she was sent to the ward, placed in an oxygen tent, and given digitalis again. Her blood pressure at this time was 190 systolic, 115 diastolic; there was some secondary anæmia (hæmoglobin 72 per cent). Cataracts were found to be developing in both eyes. At the end of a fortnight she was discharged, admonished to sleep on the first floor of her house, never to climb stairs, and to continue the use of digitalis regularly.

Present admission.—Despite the strict injunction against stair-climbing and other exertion, the patient continued to use the stairs of her house and to do some of the housework, stating that aside from some shortness of breath, recurring headaches, and some pain in her right knee (in wet weather) she had felt very well. On the night of December 29, 1935, she felt as well as usual on going to bed, but awoke in the night with severe dyspnoea, cough and frothy blood-tinged sputum (her fifth attack of acute pulmonary Œdema). Brought again to the accident room of the hospital, venesection gave relief, and she was re-admitted to the ward.

The principal positive findings on this admission included arteriosclerosis, with blood pressure 185/100, enlargement of the heart, systolic blow at the apex, presystolic gallop, moist râles at the bases of the lungs, and sluggish deep reflexes in the lower extremities. The patient had a slight pharyngitis and the teeth and gums were in poor condition. There was slight secondary anæmia (hæmoglobin 80 per cent) and the non-protein nitrogen of the blood was 44 mgm. per cent. The urine contained a little albumin and a few casts; the phthalein output was 42.5 per cent in two hours. An electrocardiogram, made four days after admission, revealed normal sinus rhythm, pulse rate 85, and levogram. Measurements in the teleroentgenogram: M.R. 5, M.L. 12, A. 6.2, T. 27.6.

On January 3rd, five days after admission, another attack (her sixth) of acute pulmonary Œdema developed. Though this was promptly relieved by the administration of morphine and atropine and by the application of

* Thursday Clinic to the Senior Students of the Johns Hopkins Medical School, January 30, 1936.

tourniquets to the lower extremities, she suddenly developed about one hour later a right hemiplegia with conjugate deviation of the eyes to the left and with temporary loss of the deep reflexes on the right side. By the next day, the motor power of the right lower extremity had returned and there was partial return of power in the right upper extremity, the residual weakness in the fingers and at the wrist being more marked than at the elbow and the shoulder; complete paralysis of the lower right face and tongue persisted, and there was still some weakness in the domain of the right upper face (*M. frontalis*; *M. orbicularis oculi*). The deep reflexes in the upper extremities were active and equal on the two sides, but were sluggish in both lower extremities; the Babinski test was negative on both sides. Dr. Grossmann said that there was loss of the power of speech, but at the time he could not be sure whether this meant an aphasia or merely an anarthria. He referred the clinical picture to a cerebral vascular accident, probably a thrombosis of the anterior branches of the left middle cerebral artery. After the attack, the patient had to be fed by tube for over two weeks. Two weeks after the paralysis a transient generalized clonic convulsive seizure occurred. This disappeared after a few minutes, leaving no residual signs, and was attributed to a hypertensive crisis. She had had a similar convulsive seizure during her convalescence from the attack of acute pulmonary edema early in 1934.

By January 23rd the general condition of the patient was better. She was able to swallow again and the tube feeding could be discontinued. Dr. Eichna found that the distal part of the right upper extremity was still weak, the paralysis of the lower face on the right persisted, and there was partial analgesia of the same area. Though the patient could hear, she could not understand what was said to her, apparently suffering from "word deafness". When spoken to by name, she would look at the examiner but would make no other response. When told to shut her eyes, to look toward the right or the left, or to raise her hand, she did not obey the command. When the examiner passively performed an act for her (for example, raising her hand to her mouth) and then by gesture indicated to her that he desired her to make the motion herself, she would not only do so but would continue to repeat the act over and over again even though the oral command was changed (perseveration). In order to get her to do something else, it was necessary to demonstrate to her by passive movement the new act desired. That she was not apraxic was shown by the fact that a glassful of water held before her was grasped and drunk and the glass put aside afterwards. Whether word-blindness existed or not could not be determined, since the patient is illiterate; certainly this was no pantomime-blindness, for movements performed before her would be imitated by her, showing that she understood signs. The patient handled objects with the left hand very well, but not with the right hand, because of weakness. There was a suggestion of right hemianopsia, since objects brought toward the patient from the right were not noticed as quickly as those brought toward her from the left. There was marked jargon-aphasia and possibly some motor aphasia.

LOCALIZATION OF THE NEUROLOGICAL LESIONS

All the evidence points to the sudden development of a lesion in the left cerebral hemisphere. The right hemiplegia, with its residual facio-linguo-brachial paralysis, indicates involvement of the lower part of the left anterior central gyrus, especially of the areas in which the pyramidal tract fibres innervating the muscles of the face, wrist, and hand have their origin. The disturbance of sensation in the right side of the face points to involvement of the lower part of the the left posterior central gyrus. The lack of understanding of speech and the distortion and confusion of words produced, combined with a perseveratory tendency (receptive or sensory aphasia; jargon-aphasia), points to injury of the left superior temporal gyrus and perhaps of the inferior

parietal lobule, especially as there was conjugate deviation of the eyes to the left at onset. The motor aphasic element suggests some involvement of the posterior part of the left inferior frontal gyrus (Broca's area). Right hemianopsia frequently accompanies sensory aphasia and may be due to extension of the lesion into the white matter deep enough to injure the left optic radiation.

NATURE OF THE NEUROLOGICAL LESIONS

Paralysis and aphasia occurring suddenly in an elderly patient who has arteriosclerosis and chronic arterial hypertension make a vascular accident seem certain as the cause of the symptoms. The symptoms and the area of the brain involved point to the domain of the left middle cerebral artery and indeed to the domains of all its distal branches. The monoplegia facio-lingualis dextra, together with paresis of the right arm and some motor aphasia, points to the first and second branches that supply the parts of the anterior central gyrus affected and the inferior frontal gyrus; the word deafness, sensory aphasia, and possible right hemionopsia point to the domains of the third, fourth and fifth branches that supply the superior temporal gyrus and the inferior parietal lobule.

The three types of vascular accident that may occur in this region include (1) embolism, (2) hæmorrhage, and (3) thrombosis. Embolism or thrombosis would be followed by cerebral softening (*encephalomalacia*), whereas hæmorrhage would exert its effects through local pressure and destruction. Can we decide upon which of the three types of vascular accident has occurred here?

First, as to the possibility of embolism, the age of the patient favours the idea of either hæmorrhage or thrombosis rather than embolism, since embolism is far more common in youth than in age. The absence of evidence of valvular lesions of the heart is also against the idea of embolism, though occasionally an embolus has had its origin in an atheromatous heart. On the whole we are fairly safe, I think, in ruling out embolic infarction in this patient.

When we try to differentiate between cerebral hæmorrhage and cerebral thrombosis the difficulty is greater. Both are common in later life. In cerebral apoplexy the blood pressure is nearly always high, but it must be remembered that it has been found high also in about half the cases of softening of the brain due to thrombosis. Moreover, a hæmorrhage large enough to injure the lower parts of the anterior and posterior central convolutions, the inferior frontal convolution, the superior temporal convolution, and the inferior parietal lobule would almost certainly have given rise to a comatose condition and to have been followed by some fever. Because of the wide area of brain substance involved without more disturbance of consciousness than occurred in this patient and without later elevation of temperature, it would seem very probable, I think, that we have had to deal with thrombosis and softening rather than with hæmorrhage.

BRIEF DISCUSSION OF THE PRESENT CONCEPTIONS OF THE APHASIAS

Since the earlier publications of Broca on motor aphasia (75 years ago), of Hughlings Jackson (72 years ago), and of Wernicke on sensory aphasia (over 60 years ago) an immense number of publications upon the aphasias has been made. In this country, the studies of the late Charles K. Mills, of Adolf Meyer, and of T. H. Weisenburg have been outstanding. In England very important contributions were made early by Hughlings Jackson, many of

whose ideas were in accord with some of the newer developments, but his papers did not receive the attention that they deserved for nearly 50 years, owing to the overshadowing predominance of the views promulgated by Broca and by Wernicke.

After the studies of Broca and Jackson, many attempts were made to localize precisely the centres for language in the cerebral cortex and to determine their inter-connections. Particularly active in this work were Bastian and Broadbent in Great Britain and Wernicke in Germany. Elaborate maps of the cortex and of the fibre-connections were constructed; Head has amusingly referred to this period as that of the "diagram makers". Marie, of Paris, in 1906 struck a hard blow at the complexity of the systems that had been promulgated, and endeavoured to simplify the situation by a revision of the doctrines of aphasia, maintaining that Wernicke's sensory aphasia was the only true aphasia, that the so-called "pure motor aphasia" should be designated "anarthria" and that Broca's aphasia should be regarded as a combination of anarthria with Wernicke's sensory aphasia. He also laid stress on the fact that in true aphasia there is not only a defect in a special language intelligence but also a defect in general intelligence.

Though, later on, efforts to continue research on aphasia from the standpoint of localization were made by many, still more valuable contributions came from those who laid especial stress upon clinical studies and upon psychological investigations of patients exhibiting aphasic symptoms. In 1913, Pick published his important treatise on "agrammatism" and, later on, contributed further to psychological explanations of the disturbances of language and of thought in the aphasias. In 1926, Henry Head published his two volumes entitled "Aphasia and Kindred Disorders of Speech" and is noteworthy for his grasp of the complexity of the process of disintegration of language and for his insistence upon more systematic studies of patients. In recent years, Goldstein, of Amsterdam, has studied aphasic responses by the method of qualitative analysis and has related amnesic aphasia to a disorder of so-called "categorical behaviour". During the past four or five years, Weisenburg and his associates in Philadelphia have conducted extensive researches upon the problems of aphasia, aided by a grant

from the Commonwealth Fund, applying new methods of investigation, and studying normal persons and patients with cerebral lesions but without aphasia for comparison with patients who had aphasia.

All of these more recent investigators have esteemed the early studies of Hughlings Jackson much more highly than did the writers who preceded them. The tendency now is to use simpler classifications than formerly, Head differentiating four types of disorder of symbolic formulation and expression (verbal, syntactic, nominal and semantic), and Weisenburg using the terms "predominantly expressive", "predominantly receptive", "expressive-receptive" and "amnesic" as descriptive of the four principal types of aphasic disorders.

As to localization of the lesions that cause aphasic disturbances, investigators are more conservative than formerly. Though there is general agreement (1) that, in the expressive group, the anterior part of the brain is the main site of the lesions with less involvement of the temporal and parietal regions; (2) that, in the receptive group, the involvement of the temporal and parietal areas is greater and that of the anterior brain less than in the expressive group, and (3) that, in the amnesic type, extensive areas may be destroyed by gliomata, even though symptomatically the chief difficulty may be that of the evoking of words as names for objects, conditions or qualities. It is now realized that in all aphasic disorders there are accompanying disturbances that point to disordered function of the brain as a whole. From now on progress must depend upon more exact clinical and psychological studies, on the one hand, and more precise pathological-histological controls, on the other.

SELECTED RECENT REFERENCES

1. AMYOT, R. AND SAINT-GERMAIN, J. P.: Hémiplégie droite et aphasie sensorio-motrice. *Problème étiologique, L'Union méd. du Canada*, 1934, 63: 1105.
2. BARKER, L. F.: Topical diagnosis of the aphasic, the agnostic and the apractic disturbances. In his *Clinical Diagnosis of Internal Diseases*, Appleton, N.Y., 1916, 3: 449.
3. EWING, A. W. G.: *Aphasia in Children*, Oxford University Press, N.Y., 1930.
4. GOLDSTEIN, K.: Kritisches und Tatsächliches zu einigen Grundfragen der Psychopathologie, im besonderen zum Aphasieproblem, *Schweiz. Arch. f. Neurol. u. Psychiat.*, 1934, 34: 69; 230.
5. HEAD, H.: *Aphasia and Kindred Disorders of Speech*, 2 vols., Macmillan, N.Y., 1926.
6. OPPENHEIM, H.: Die Störungen der Sprache. In his *Lehrbuch der Nervenkrankheiten*, 7 Aufl., Berlin, 1923, 1122.
7. STEVENSON, L.: Aphasia. In Cecil's *Textbook of Medicine*, 3rd ed., Saunders, Phila., 1933, pp. 1418-1423.
8. WAGGONER, R. W. AND KAHN, E. A.: Critical study of aphasia, *Arch. Neurol. & Psychiat.*, 1932, 28: 1178.
9. WEISENBURG, T. H.: A study of aphasia, *Arch. Neurol. & Psychiat.*, 1934, 31: 1.
10. WEISENBURG, T. H.: Aphasia in brain tumours, *Ann. Surg.*, 1935, 101: 373.

Case Reports

A CASE OF MENINGITIS DUE TO *B. PROTEUS*, WITH RECOVERY

By JOHN C. CALHOUN, M.D., F.R.C.S.(C.),

Toronto

The object of this report is to place on record an example of a very rare form of meningitis, namely, that due to *B. proteus*. The patient fortunately recovered.

Miss B.H., aged 25 was admitted to hospital late in the evening of May 5, 1935, complaining of headache, earache, dizziness and vomiting, of one day's duration.

Immediate past history.—She had had an attack of "intestinal flu" one month previously, during which she vomited persistently for three or four days, was constipated, and felt dizzy. She was in bed for three weeks, but had been well subsequently.

Past illnesses.—She had had a chronic discharging left ear since childhood. Apart from this the only significant complaints were tuberculous glands (cervical) seven years previously and an appendix operation three years previously. She had evidently always had some trouble with constipation.

Examination.—On admission the right ear was negative. The left ear showed some thickening in Shrapnell's area; most of lower quadrants of the membrana tympani were missing; scanty but foul discharge; no external evidences of inflammation over the mastoid and only very slight tenderness on pressure over the antrum. There was complete deafness (noise apparatus) in the left ear. Bone conduction was lateralized to the right. The fistula test was negative. Spontaneous nystagmus both ways was noted, more marked on induction to right. Caloric test—no reaction on left side. There did not seem to be any clouding of the sensorium nor paresis of any of the cranial nerves. She was cooperative and, apart from the extreme nausea and vomiting, the only other suggestive feature was slight rigidity of the neck. A diagnosis of acute purulent labyrinthitis with possible onset of meningitis was made.

On the following day there were more definite evidences of meningitis. Neurological examination reported by Dr. H. Hyland was as follows.

"Examination shows the following positive signs—Patient cooperative and mentally clear, nystagmus on conjugate deviation to right, neck definitely stiff on flexion. Kernig's sign slightly positive. The patient staggers to right on walking, yet turns fairly well and does not fall on standing with feet together. Visual fields, fundi, coordination tests in bed, reflexes, tone, etc., all negative. At present time no definite evidence of cerebral involvement but patient may have a lateral sinus thrombosis or a commencing meningitis (strep. or pneumo.). Advise lumbar puncture and if fluid clear operation is indicated as soon as possible."

The lumbar puncture showed cloudy fluid; Pandy test reaction 2 plus; cell count 4,300 (mostly polymorphonuclears); jugular compression even. In spite of the spinal fluid findings, and chiefly because the mentality remained clear, we operated immediately. The mastoid process was dense and eburnated, of the non-cellular type, with a very deep-set small antrum, in the neighbourhood of which was found a small amount of pus under pressure, which gave a pure culture of *B. proteus*.

There was no obvious lead from this small collection of pus anywhere. The sinus appeared normal and a large area of uncovered dura showed no gross evidence of meningitis. The posterior canal was skeletonized and the dura around the petrous bone more radically exposed than usual. The middle-ear portion of the operation was completed and the wound left wide open. No flap was cut but the original post-aural incision carried far forward over zygoma. This was done in order to pin the ear forward and allow maximum aeration. The only deviations from the ordinary procedures in after treatment were that (at the suggestion of Dr. P. Goldsmith) no packing was used and almost continuous irrigation with saline solution was instituted, and, secondly, that she had frequent spinal punctures daily for the first few days and gradually at increasing intervals.

After-course.—May 7th to May 9th, the patient was slightly better than holding her own, but still very nauseated, vomiting at times and drowsy. May 10th.—Definite improvement; spinal fluid clear and sterile. May 16th.—Improving rapidly; the temperature was approximately normal; she was able to flex her chin on the chest. From this point on until discharge from hospital on July 13th, convalescence was rapid and uneventful. She is now, (December, 1935) completely deaf in the left ear, but otherwise normal in every way. The cytology of the spinal fluid was interesting and corresponded precisely with her clinical improvement. After the first count of 4,300 there was a drop to 650 and the polymorphonuclears were being rapidly replaced by other white blood cells. The punctures were kept up at intervals until June 24th, the last count being 19 white blood cells. The first two reports showed *B. proteus* and then no growth.

The so-called "intestinal flu" a month prior to admission was probably a labyrinthine storm that she was lucky to survive. The normal habitat of the *B. proteus* is the intestine. This girl had evidently had considerable ill-defined intestinal distress, and I throw out the suggestion that the intestinal tract might possibly have been the original focus for this particular bacillus in the ear.

The literature on meningitis due to *B. proteus* is meagre. Neal and Abramson¹ made an extensive search and only 7 cases were discovered by them. One case in Constantinople, originally diagnosed as typhus fever, recovered; all the others (mostly aural) were fatal. They further say: "As a causative factor in meningitis the genus *Proteus* seems to be rare. In a series of nearly 2,000 cases of meningitis of various kinds seen by members of the meningeal division research laboratory Department of Health, New York City, it has been found only twice. In both these instances it was associated with other organisms." Kernan² reported two cases of septicæmia, one of which is included in the seven case reports referred to above. Gallagher³ re-

ported a case of temporo-sphenoidal abscess with recovery. This case had a cell count of 450 but no organisms in the spinal fluid. Pavey-Smith and Miller⁴ had a fatal case of lateral sinus thrombosis with generalized septicæmia due to *B. proteus*. Stein⁵ reported three cases of septicæmia, one being from a secondary mastoid and the other two associated with tonsilleectomy.

The records of the Toronto General Hospital, I believe, show one case of meningitis due to *B. proteus*, and it was fatal.

REFERENCES

1. NEAL, J. B. AND ABRAMSON, H.: Genus proteus in meningitis, *Am. J. M. Sc.*, 1927, 174: 665.
2. KERNAN, J. D., JR.: Two cases of infection by *B. proteus*, *Laryngoscope*, 1922, 32: 304.
3. GALLAGHER, J. R.: Bacillus proteus brain abscess, *Yale J. Biol. & Med.*, 1929, 2: 143.
4. PAVEY-SMITH, A. B. AND MILLER, S.: Lateral sinus thrombosis due to bacillus proteus, *The Lancet*, 1935, 1: 862.
5. STEIN, S.: Bacillus proteus vulgaris infection in secondary mastoiditis, following tonsilleectomy, and radium implantation in the tonsils, *Ann. Otol., Rhin. & Laryng.*, 1930, 39: 1155.

A CASE OF RUPTURE OF THE SPLEEN

By J. R. MULLOY, M.D., C.M.,

Cardston, Alta.

A young man, twenty-two years of age, was admitted to the Cardston Hospital in July, 1935. He complained of passing blood in his urine, severe abdominal pain, faintness, nausea and vomiting.

He gave the history that in trying to catch a team of horses which was running away he ran into a stump, injuring the left side of his abdomen.

Examination showed a healthy, well-built young man, weighing about 180 lbs. There was some pallor, and the man looked extremely ill. A specimen of his urine showed it to be mixed with a good deal of blood. The abdomen on examination showed marked rigidity and tenderness along the whole left side, especially over the region of his bladder.

His condition pointed to a serious abdominal injury, and an exploratory operation was decided upon at once. With the maximum tenderness over the urinary bladder and the blood in the urine, it was decided to open the abdomen in the suprapubic region. When the abdomen was opened about a quart of free blood was found in the pelvis. This was sponged out, and in doing so a mass of tissue was found which proved to be the lower third of the spleen. The bladder was intact, and no break in the peritoneum covering the kidney was found.

The wound was closed and a left rectus incision was made in the left hypogastric area. The spleen was normal, except that the lower third was torn away. There was a constant ooze from this lacerated margin. The whole lower edge of the organ was sutured with mattress sutures with great difficulty. A small drain was put down to the raw area and the abdomen was closed. The young man made an uneventful recovery.

This case is interesting in that we have here in the same patient a damaged kidney and a lacerated spleen. It is of further interest in that this man had to come forty miles for treatment, and that he did not succumb to hæmorrhage on the way.

CHLORAMINE ALLERGY.—E. B. Salén states that in Sweden preparations of chloramine have recently come into common use as domestic disinfectants; they have been proposed for food preservation, and are much used in veterinary practice. In connection with the last sphere of usefulness he encountered what he believes to be the first recorded case of hypersensitiveness to the drug. A veterinary student, from the time of coming into contact with the powder from which chloramine solution was freshly prepared, suffered from naso-pharyngeal catarrh followed by erythema, urticaria, and angioneurotic œdema. An acute and alarming attack of asthma fol-

lowed his treating a scratch by chloramine applications. Hypersensitivity to this substance was then proved by intracutaneous test injections, and by transference of his serum to other subjects. Desensitization by increasing injections of minimal amounts of chloramine in combination with adjuvant treatments removed the allergy. A latent sensitivity to chloramine was found by cutaneous tests in ten of twenty-nine veterinary surgeons. In four of them it seemed certain, and in four probable, that allergic manifestations from which they suffered were due to contact with chloramine.—*Acta Med. Scand.*, 1935, v-vi, 486. Abs. in *Brit. M. J.*

Editorial

CHRONIC POISONING WITH CARBON MONOXIDE

CARBON monoxide as a menace to life and health is gaining importance steadily as time goes on. The reason for this is, in the main, the increasing use of the internal combustion engine. Gasoline motors, the automobile, the aeroplane come specially into thought here, of course, but faulty gas-ranges and the imperfect combustion of coal are also important. The practice of smoking also should be mentioned.

Acute carbon monoxide poisoning is very well understood. Its immediate manifestations and its sequelæ are so obtrusive that they have demanded and have obtained much attention. It is somewhat different with chronic poisoning. The situation here is more elusive. The signs and symptoms are not striking and must be looked for, and the factors involved are many and variable. While it is possible, and even likely, that certain forms of ill-health should be attributed to exposure to small doses of carbon monoxide over prolonged periods of time we seem to have gained merely impressions and few concrete facts. We therefore welcome a study of the subject by Dr. Paul Michael¹ (a graduate of McGill University, by the way), in which he gives us the results of his own experiments and observations. His paper is a valuable contribution to the elucidation of an important and difficult problem.

Chronic poisoning with carbon monoxide seems to have been first mentioned by Moreau in 1869 (quoted by Lewin²) who termed it "the insanity of cooks" and ascribed it to working over badly ventilated stoves. Since that time some interest has been taken in the subject, particularly by Henderson and Haggard³, Alice Hamilton⁴, Armstrong⁵, and Jones.⁶

Carbon monoxide is not a true poison but acts by diminishing the oxygen-carrying capacity of the red blood corpuscles. Its affinity for hæmoglobin is three hundred times greater than that of oxygen, so that it easily replaces that element after a brief exposure. Michael states that cerebral symptoms occur when one-fifth of the hæmoglobin is taken up, while death may be expected if two-thirds is unavailable.

In considering the hazard from carbon monoxide which the ordinary man who is living an ordinary life undergoes we may deal first with the question of smoking. Jones (*loc. cit.*) and Armstrong (*loc. cit.*) have found that the incomplete combustion of tobacco leads to the production of carbon monoxide. Michael gives the following figures from his own observations. In an unventilated room, 8 by 10 by 12 feet, one person may, by continuous smoking, develop rather high concentrations of the gas in his blood. Taking cigarettes, pipes, and cigars, in the order given, the following figures were obtained: at the end of one hour, 0.5, 0.5 and 1.1 parts of carbon monoxide in 10,000 parts of air, with a blood saturation of 0; at the end of two hours, 2.0, 2.5 and 2.9, with a blood saturation of 2.3, 4.0 and 5.0 per cent; at the end of three and one-half hours, 4.0, 4.5, and 6, with a blood saturation of 5.0, 6.5, and 10 per cent. However, these figures would be excessive for the average smoking room where there is ventilation. Whether the amount of carbon monoxide introduced into the blood through smoking is harmful is hard to say. Doubtless, the danger would be greater if the smoke is inhaled.

Michael studied 100 garage workers and obtained positive blood findings in 15. At the worst time of the day for these men the percentage of saturation ranged from 8 to 12.

1. MICHAEL, P.: Chronic carbon monoxide poisoning—a present day hazard, *Calif. & West. Medicine*, 1934, 40: 19.
2. LEWIN, L.: Die Kohlenoxydvergiftung, Berlin, J. Springer, 1920.
3. HENDERSON, Y. AND HAGGARD, H. W.: Health hazard from automobile exhaust gas in city streets, garages, and repair shops—the vertical exhaust as a practical measure of amelioration, *J. Am. M. Ass.*, 1923, 81: 385.

4. HAMILTON, A.: *Bull. U.S. Bureau of Labour Statistics*, No. 291, Wash., 1922.
5. ARMSTRONG, H. E.: Carbon monoxide in tobacco smoke, *Brit. M. J.*, 1922, 1: 992.
6. JONES, G. W.: Carbon monoxide hazards from tobacco smoke, *Bureau of Mines Reports of Investigations*, Ser. No. 2539, 1923.

Most of these men were underweight, were pale and sallow, and complained of lassitude and vague gastro-intestinal symptoms.

The hazard from carbon monoxide inherent in street traffic is hard to assess. Those who are specially liable to trouble are not the ordinary pedestrians but those who are compelled to spend a large proportion of their waking hours in the street, particularly when they are for periods of time stationary at street corners and stopping places, such as traffic policemen, taxi drivers, street cleaners and newsdealers. Michael has followed for great lengths of time in the wake of large buses and has found that when they stop at intersections the surrounding air takes on a definitely high concentration of carbon monoxide, even if this be but temporary. As the sellers of newspapers are usually located at these intersections many were examined for carbon monoxide. At the height of the evening traffic 12 of 25 persons examined showed blood saturations of from 2 to 4 per cent. Probably here is a potential danger if the exposure were to be continued over many years.

On ferry boats, where many automobiles may be carried and their engines will be running for short periods, the hazard seems to be negligible. The same thing may be said in connection with aeroplanes, at least, those of the latest type.

Michael gives some interesting facts in regard to the contamination of the air in the Posey Vehicular Tube, a common

thoroughfare running under the Oakland estuary between Oakland and Alameda, California. In this tube as much as 240,000 cubic feet of carbon monoxide are discharged in one hour. The ventilating system, however, has been so efficient that the content of gas has been maintained at or below 2 parts per 10,000 parts of air. Despite these low figures, however, several of the maintenance men developed a train of symptoms which led to the institution of a medical survey. The men in question complained of frequent temporal headaches, dyspnoea, slight palpitation on exertion, weakness, anorexia and nervousness. Objectively, they exhibited loss of weight, pallor, hypotension, conjunctivitis, congestion of the retinal vessels with bright red blood, pulmonary congestion, and, occasionally, tremor of the hands. There were also polycythæmia, with red cell counts as high as 6,000,000, glycosuria occasionally, a slight shift of the blood towards the alkaline side, with a carbon dioxide combining power of 58 to 65. Concentrations of carbon monoxide in the blood of from 5 to 10 per cent were found. Clearly, in the case of obscure illnesses, particularly if not of a clean-cut character, the question of chronic carbon monoxide poisoning should be considered, at least in the case of those persons who for any reason may be suspected of being exposed more than others to that particular hazard.

A.G.N.

THE PROTECTION OF NURSES AGAINST TUBERCULOSIS

IT would be difficult to say just when tuberculosis first became generally recognized as an infectious disease, but we would probably be safe in saying that the realization of this truth was only gradual; and even then it took some time before much was done about it. It is rather curious that one of the last things to be recognized has been the serious menace of tuberculosis to our nursing profession. This is well brought out in the last report of the Committee on Research of the Canadian Hospital Council.* The Committee is convinced that "up until

a few years ago nurses, particularly in general hospitals, undoubtedly were not given the protection against this infection that they were entitled to". The actual incidence of tuberculosis amongst nurses, however, has been difficult to determine. Two years ago an interim report of the Committee presented most alarming findings. These have been modified to some extent, but only so far as to say that the disease amongst nurses is not so general as was thought but is more local in nature. Estimations of its incidence show such wide variation that until more information is gained it will be impossible to make definite assertions, beyond saying that

*Bulletin No. 18 of the Canadian Hospital Council, 1935.

in many hospitals, particularly general hospitals, the incidence is far greater than it should be.

This report comments on the increased interest being shown in the matter. The Province of Alberta, for example, passed an Order-in-Council in January, 1935, enacting that,

"The Hospital Board shall see that every nurse in training, every attendant and every new graduate nurse taken on the staff is given a complete physical examination including an x-ray examination of the chest before . . . (being) . . . accepted or placed on duty. In the case of the nurse in training and the attendant a complete physical examination including an x-ray examination of the chest shall be made at least once every twelve months throughout the period of training."

And in July, 1935, the Ontario Department of Health ordered that every nurse in a sanatorium or general hospital should receive a tuberculin test within a month of entering service, an x-ray to be taken of the chest when the test was positive.

The weak point in our defence lies in the general hospitals rather than in the sanatoria, where the strict technique and frequent examinations of nurses reduce the risk to the minimum. What figures we have show that undoubtedly there is a lower incidence of tuberculosis amongst nurses in sanatoria

than in general hospitals. The general hospital, of course, has much more difficulty in protecting the nurse, especially on the surgical side. It is quite possible for a patient with an active pulmonary lesion to be admitted with, let us say, a fractured femur, and to be nursed for some weeks before his tuberculosis is recognized. Even a careful physical examination is not enough to rule out tuberculosis. Many active lesions can only be detected by the x-ray. Constant sputum examinations are most valuable, but would be a heavy addition to the routine work of a busy surgical ward. Such obscure cases do not occur often. Do they justify a routine x-ray examination of every admission to the hospital?

As regards the nurse herself, there is probably no good training school which does not now insist on preliminary examinations of applicants, including x-rays of the lungs and tuberculin-testing at regular intervals. The Committee's recommendations on this and many other points regarding protection of hospitals' staffs against tuberculosis deserve the serious attention of the profession.

H. E. M.

Editorial Comments

The Health Insurance Bill in British Columbia

We reproduce in full on page 685 an editorial from the *Bulletin of the Vancouver Medical Association* (May, 1936), which sets forth the views of the medical profession in British Columbia regarding the Health Insurance Bill recently passed by the Provincial Legislature. We feel that the profession in Canada generally should be shown something of the difficulties which are being faced by their brethren on the Coast. Not only that; we feel that all of us have a good deal to learn from the way in which these difficulties are being faced. The legislation at first proposed in the draft bill of March, 1935, might, with certain modifications have been satisfactory, but the legislation, in its present form, involves injustice to the doctors, and will lead inevitably to hardship and inadequate medical service for the people. And yet, we think it will be agreed that the tone of this statement of the doctors' side is a model of dignity, of fairness, and of clear, firm thinking.

A letter has been sent to the members of the profession in British Columbia by their Health

Insurance Committee advising strongly that there be no definite stand as to working under the Act, until it is known exactly what the Government will suggest regarding the services to be rendered and the remuneration to be offered. It is understood that no medical man can be compelled to provide service under the Act against his wishes.

It is needless to add how sincerely we wish our fellow practitioners a happy issue out of their afflictions, and how strongly we support their resolute stand for a fair deal for both doctor and patient.

H.E.M.

The Late William Blair-Bell, M.D., F.R.C.S.

The death of William Blair-Bell occurred suddenly in a train on January 25, 1936. By his death the profession has lost a distinguished and inspiring leader. A judicious combination of the investigating type of mind with an admirable clinical sense brought him to a leading position in his specialty, that of obstetrics and gynaecology.

Dr. Blair-Bell was born at Wallasey, England, in 1871, the son of the late Dr. William Bell.

J.P. and of Helen, daughter of the late General Butcher. He was educated at Rossall School, King's College and King's College Hospital, London. He obtained the Conjoint Diplomas in 1896, the M.B., Lond. in 1897, the M.D. in 1902, and the B.S. in 1904. He was elected a Fellow of King's College in 1928.

His special distinction may be said to have begun when he published some papers on physiology and clinical gynaecology which were well received, and he was, in 1905, appointed gynaecological surgeon, with the care of out-patients, in the Liverpool Royal Infirmary, and gynaecologist to the Wallasey Cottage Hospital. From the start he adopted the laboratory-ward system, correlating research and clinical observations, much as Osler did at Johns Hopkins. His studies and interest led him to investigate the physiology of sex in a degree that had never been done before. In his Arris and Gale Lectures (1913) on "The Genital Functions of the Ductless Glands in the Female" he advanced the thesis, probably for the first time, that the functions of reproduction are controlled by the action and reaction of all the organs of internal secretion rather than by the gonads alone, as had usually been thought. His book, *The Sex Complex*, (1916), brought together and amplified his former observations. In 1919 he brought out an extensive monograph, *The Pituitary*, which won for him the John Hunter Medal and the Triennial Prize of the Royal College of Surgeons, and the Astley Cooper Prize for original work on the same subject. Blair-Bell was the first to draw attention to the value of pituitrin in obstetrics, based upon his satisfactory experience with this substance in the treatment of three cases of post-partum hæmorrhage. In 1910 his textbook, *The Principles of Gynaecology*, appeared, a work conceived along new lines, which at first was looked at askance but eventually was widely accepted.

In 1913 Blair-Bell became Senior Surgeon to the Liverpool Royal Infirmary, and in 1921, Professor of Obstetrics and Gynaecology in the University of Liverpool, the latter, a position which he held until 1931, when he retired with the title of Emeritus-Professor.

Perhaps more than all that has been mentioned Blair-Bell's fame, at least in other countries than his own, was attributable to his notable studies on the treatment of cancer by means of lead. This work was begun in 1909 and was based on the hypothesis that chorionic epithelium, and particularly the syncytium, was normally a malignant tissue, having the vegetative qualities and the invasive power of cancerous growths. Realizing that lead was being used as an abortifacient, when it appeared to exert toxic activity on young embryonic cells, he was led to the conception that it might possibly restrain the growth of tumour cells. In 1920 he treated an inoperable medullary carcinoma of

the breast with a partly colloidal lead iodide injected intravenously. Within a month the primary growth had practically disappeared and the enlarged glands had diminished. Other encouraging results were obtained and the work was later assisted by a Cancer Research Committee founded by the University of Liverpool in 1923. By 1930 more than sixty papers by Blair-Bell and his associates on the subject of lead and cancer had appeared. These researches were assembled by him in 1930, in *Some Medical Aspects of the Cancer Problem*. In this intricate matter the author gave evidence of that caution and fairness of mind which had always characterized him.

Blair-Bell was chosen to be the first president of the British College of Obstetricians and Gynaecologists on its formation in 1929, and was a member of numerous learned societies concerned with his specialty, both at home and abroad. He was elected a Fellow of the Royal College of Surgeons of England and a Fellow of the American College of Surgeons. He was an honorary LL.D. of Glasgow and Liverpool. He was a Commander of the Royal Order of the Star of Roumania. Altogether, a conspicuous figure, whose work has had and will have far-reaching results. A.G.N.

"State Medicine"

A delusion held by many voters is that state medicine means free medicine. Anyone who opposes the rapid and immediate introduction of state medicine is regarded as a sort of monster who really wants people to be sick, or who grudges sick people proper care. The Saskatchewan Minister of Health in discussing state medicine has asked, "Who is going to pay for it?" The usual answer is, "The taxpayers". But the taxpayers of Saskatchewan are already more than forty million dollars behind with their payments. So the Minister of Health spoke out and said, "This is not the time for state medicine", thus marking a new departure in political speeches. It is an exhibition of adult mentality which is a refreshing change from childish hopes that the state will take more and more responsibility from the individual without knowing or without caring where the burden ultimately falls. It is an attitude which may not win votes from the masses but will be appreciated by those who have the old-fashioned notion that a debt is an obligation to be met.

LILLIAN A. CHASE

Dr. Edward W. Archibald

The members of our Association and the many friends of Dr. E. W. Archibald, of Montreal, will rejoice in hearing of the new honour that has come to him. On April 22nd he was awarded the Trudeau Medal of the National Tuberculosis

Association at its meeting in New Orleans. This award is conferred annually on "that individual who in the judgment of the Association has made the most meritorious contribution on the cause, prevention or treatment of tuberculosis." Doctor Archibald was selected because his work led to the introduction of the operation of thoracoplasty in America. His first operation of the kind was performed in 1912.

Doctor Archibald has received other titular distinctions. He was the first Canadian surgeon to be elected an Honorary Fellow of the New York Academy of Medicine; he is an Honorary Fellow of the Royal College of Surgeons of England; and last year he was made an Honorary Fellow of the Royal College of Surgeons of Australasia; he is also a Fellow of the American College of Surgeons and of the Royal College of Surgeons of Canada. Doubtless there are

some others that should be noted! All will agree that these various distinctions have been well won and are gracefully borne. A.G.N.

Dr. D. E. Robertson

The *Journal* desires to join with the other friends of Dr. D. E. Robertson, and on behalf of the members of our Association, in expressing to him our sincere gratification that he has escaped the grave peril to which he was recently exposed in the Moose River Mine. Only a man of steadfast courage, of resourcefulness, and sound physique could have come through the ordeal as he did. We rejoice with him. To Mr. Scadding also we extend our greetings. We trust that neither of these gentlemen will be eventually the worse for their terrible experience. A.G.N.

Medical Economics

The Health Insurance Bill of British Columbia:

An Editorial in the *Bulletin of the Vancouver Medical Association*. May, 1936

"We publish herewith a copy of the Health Insurance Bill,* which, after suffering many things, like Ulysses, has at last been passed at the recent sitting of the Legislature. There has been some criticism directed at the medical profession over this Bill, and it would be idle to deny the fact; but we do not think the criticism is necessarily well-founded.

"We have been criticized for opposing the Bill. Well, we admit that freely. The original draft Bill was not in any way perfect; in many ways it was bad; but it was a long way better than this one. It *did* purport to look after *all* the members of the community whose yearly income, whether from indigence or low wages, fell below a certain level. It *did* acknowledge the fact that the Government should contribute to the Act, by at least half the lost of administration. It *did* acknowledge the medical profession. It seemed to recognize the fact that medical men will be necessary in the working of this Act, and it gave us a certain amount of say in the administration of the Act. It *did* make some attempt to ensure that the income obtained from assessments, etc., would more nearly meet the necessary outgoings.

"But gradually, under the pressure, not of clearer knowledge and riper judgment, but of political necessity, this Bill was pruned

and shorn of these characters—till after a battle, never equalled, as we believe, in these parts at least, the Bill has emerged, a sorry enough spectacle. For it is a pale shadow of its former self, anæmic and paralyzed in its lower limbs, or lower income-levels, if you prefer. It no longer makes a pretence at humanitarianism, which we were led to believe was the main impulse animating its progenitors. The indigent, the domestic servant, the casual labourer, the part-time worker, those in receipt of old-age and mothers' pensions, in fact all the people who really need medical aid the most, and cannot afford it at all, are or may be excluded. The Government's contribution is removed. The contributions from those who do pay are not sufficient, on any calculation, to give what we would consider to be an adequate medical service.

"We have been criticized, as a profession, for opposing this Bill, because it has been said of us that our reason for opposing it is that our remuneration is too low. It is quite true that this is one of our reasons—and there is nothing criminal in trying to get adequate pay for the work expected of us. The amount originally set aside for this purpose would mean economic slavery for the majority of medical men, and we do feel that we have a right to oppose this. The upper limit has been removed, and there may be now some room to bargain—but even so, this is not our main reason for objecting to this Bill.

"Our main reason is that we know that this Bill will not give what was promised to those who come under it, namely, a complete and adequate medical service. Those who think it will are due for a major disappointment. No

* This refers to the issue for May, 1936, of the *Bulletin of the Vancouver Medical Association*, in which the Health Insurance Bill is printed in full. Those specially interested in the details of the subject can obtain this information from the Secretary of the Vancouver Medical Association. [Ed.]

partial Health Insurance Bill, such as is this, or those in effect in England and Germany, has ever given, or will ever give, a good service. It is true that this Bill promises specialist service, but it does not provide funds to give it, and it is governed by two pernicious principles. The first is that if enough money is not obtainable medical benefits will be reduced; the second is that if there is not enough money to pay adequately for all the service given a reduced rate of pay must be accepted. We confess that we cannot remember ever having heard of a contract of any sort or description being signed on these terms.

"We have been criticized as a profession for not giving our views to the public before this, while radio, press, pulpit, and university classroom have been freely conscripted and used without stint for purposes of propagation of the new gospel. Our reasons for this are old-fashioned, but we believe good ones, notwithstanding. We wanted to play fair. We might long ago have expressed ourselves—but there was no definite statement, only "memoranda", and we did not feel that we were right in attacking anyone on suspicion, or through mistrust of their motives, until definite legislation was brought down. But we think as medical men we are justified in pointing out to those who may, as many of our friends still do, ask our opinion of this legislation. We may rightly warn them of the following dangers as we see them; the following defects in this Bill:

"First, the danger to industry—the economic threat of this Bill, provincial in scope, applied at a time when industry is gasping for life, and has to compete with stronger, more established industry elsewhere.

"The danger, almost the certainty, that the assessments will not be enough, and will very soon have to be raised. This is the history of all such social legislation. Workmen's Compensation Acts, Old Age Pensions, Mothers' Pensions, Social Service—all these cost more and more as the years go by—and we are sure this will be no exception.

"The danger of poor, hurried, inadequate medical service and the lowering of medical standards of practice. Anyone who knows anything about panel practice in Great Britain knows that its standard is deplorably low—and we fear that the tendency under this Bill will be in the same direction. Certainly, under a capitation system of payment, there would be grave danger of this.

"The absence of any preventive measures designed to lessen disease.

"The exclusion of the indigent and those whose income is uncertain and very small. This is one of the worst defects of this Bill.

"The inadequacy of hospital arrangements. This has been consistently ignored, though hos-

pital authorities have been most definite in their warnings.

"We have been accused of opposition to health insurance. This is not true. We are unanimously in favour of health insurance, and that is why we do not like this legislation. We foresee nothing but disillusionment and disappointment over this Bill, which, we were told, was to be so far in advance of all such legislation—and, in the last analysis, has turned out to be no better than the average old-time legislation.

"In its study for many years of Health Insurance the medical profession has gradually formulated a series of principles which it believes should govern any Health Insurance scheme. The basic object of these principles is to safeguard both our own interests and those of the public who would benefit under the Act, and we believe that both these things are essential. Thus we believe that the indigent should be included and those of very small income; that prevention should be a major feature in this type of legislation; that doctors should be paid for services rendered, and not according to a capitation fee and so on. We have not seen any reason to change our minds in these matters—and believe that if the public demands and is to obtain adequate, modern, and scientific medical service these principles must still be maintained.

"Lastly, we feel we must say a word about the work of Dr. W. H. Sutherland, M.L.A., in regard to this Bill, as it passed through Committee. His attitude has been worthy of the highest praise. He showed firmness and dignity, a due sense of the amenities, and a true respect both for the House and for the profession he represented. In the record as we have seen it, he refused steadily to yield to expediency, or to sacrifice his principles, and we congratulate him sincerely on his conduct in a very trying situation."

A Letter to All Members of the Medical Profession in British Columbia

Dear Doctor:

In this issue of the *Bulletin* you will find a verbatim copy of the Health Insurance Act as passed by the Provincial Legislature on March 31, 1936.

The Health Insurance Committee has been delayed in reporting to the members of the medical profession by various causes: the first being that it was felt desirable that every medical man should have a copy of the Act to study for himself. This is our reason for printing this Act *in extenso*; as it would have been extremely difficult to obtain the six or seven hundred copies necessary in any other way.

We ask that everyone study this Act carefully, and note the following:

It will not come into effect until it is proclaimed by the Lieutenant-Governor-in-Council, and probably this will be done in sections: the first section dealing with the appointment of a Commission to set up machinery, draft regulations, arrange methods of payment with doctors, hospitals, etc., and determine forms of treatment for those benefiting under the scheme.

The Commission has been given wide powers both as to the extent and nature of the benefits to be given and the amount of remuneration to be paid.

It is our definite understanding, both from statements of the Hon. G. M. Weir in Committee and from legal opinion, that no medical man can be compelled to provide service under this Act unless he so desires. If he agrees to do so, he is subject to regulation, but until and unless he so agrees he is a free agent.

The Committee is strongly of the opinion that it would be unwise for the profession to take any definite stand as to working under this Act until the regulations have been made known, and until we know what the Government will suggest with regard to the services to be rendered, and the remuneration that will be offered. When these are known, the Committee will study them carefully, and will be prepared to make definite recommendations to the profession. No action of any sort will be taken by the Committee without the full knowledge and endorsement of the profession throughout the Province, through the Council, and through accredited representatives of the various sections.

In the meantime, the Committee wishes to take this opportunity of thanking the medical men for their loyalty and unqualified support during the difficult year that has just passed. It realizes the strain and anxiety that have been felt by all medical men, and it has been conscious of this, and has been doing its best to conserve the interests of the profession. It has received pledges of support, and assurances of united action from every district. Direct canvass of every man has shown almost complete unanimity, and it is of the greatest possible importance that this should continue to be the case. Especially during the next few months

will our solidarity be tested, and it must not fail. Sooner or later we shall be called on for decision, and we must act as a united body.

The upper limit of money available to pay doctors has been removed, and this, in the opinion of the Committee, renders the Bill somewhat more elastic, and makes negotiations possible.

We believe that there is still room for negotiation, and that terms satisfactory to both parties can be arranged—but this can only be secured if we act as a unit.

Independent action on the part of any medical man can only lead to disaster for himself as well as for all the members of the profession; and we most earnestly ask any medical man who may be approached with a view to action under this Act to refer to the Committee at once. We must make it clear that we are acting as members of a united profession, not individually.

A study of the Act, and especially of the comments on it in a separate column will, we believe, convince any man that unity is most urgently necessary if our standards of practice and living are to be maintained, and if adequate medical service is to be secured for the beneficiaries under this Act.

There will, at a very early date, be opportunities given for the freest possible discussion of this bill and of our future policy. Open meetings, whether luncheon meetings or afternoon meetings, will be arranged; speakers familiar with the Act will lead the discussions, and everyone will be given an opportunity to express his views, to ask questions, and to contribute suggestions.

In the meantime, your committee has closely reviewed the Act, and is ready, as soon as opportunity offers, to indicate clearly and definitely to the profession what line it thinks should be followed. This will, of course, depend upon the suggestions and proposals that will be made to us by the Commission, and every effort will be made to obtain an amicable and satisfactory understanding, on terms that are fair and equitable to all.

W. E. AINLEY, *Chairman.*

THE NIELSEN METHOD OF RESUSCITATION.—A new method of resuscitation, increasing the safeguard on beaches and other bathing places as well as in many industries, has been developed by Holger Nielsen, a Danish sports director and is described in the *New York Times*. Taking the well-known Schaeffer method to represent 100 per cent efficiency a board of representatives of the Danish Red Cross and Life Saving Organizations gave the Nielsen technique 141 per cent and unqualified endorsement. With the Nielsen method the operator kneels at the head of the patient, instead of astride his

hips, puts pressure on the shoulder blades instead of lower down on the rib structure, and at the conclusion of each pressure permits his hands to slide to the patient's arms and raises them very slightly. By this small action, seemingly inconsequent, the operator removes the weight of the patient's torso from his chest and makes it expand so greatly as to cause the lungs to accept almost double the quantity of air that can be taken under any other method. This slight lift lessens the number of forced respirations to the minute, but causes an increase in the depth of each breath of a full 99 per cent over the Schaeffer method.

Men and Books

THE TENDON OF ACHILLES

By J. HAROLD COUCH,

Department of Surgery, Toronto
General Hospital,

Toronto

Neither the classical testimony bearing on the vulnerability of the heel of Achilles nor the adoption of the name, *tendo Achillis*, into surgical terminology are as old as might at first be supposed. The Homeric poems allude in no way to the story of Achilles' heel, which is in fact only one of many later accretions to the Achilles legend and is most specifically treated by two late Roman writers, Fulgentius (*Mythol.* III, 7) and Statius (*Achill.* I, 269).

The story in brief runs somewhat to this effect.¹ Thetis, the divine sea-nymph, mother of Achilles, was destined by fate to bear a son who should exceed his father in power. The tardy discovery of this oracle caused Zeus, the king of Heaven, discreetly, to abandon his intention of marrying Thetis. He remembered too well the manner in which the last two kings of the gods, his grandfather Uranos and his father Kronos, had each in turn been overcome by his own son, and he had no wish to invite such a disaster upon himself. Thetis was left, therefore, to become the wife of the mortal Peleus, and their son Achilles, in fulfillment of his destiny, quickly eclipsed the prowess of his mediocre father. Thetis sought to confer immortality on her son by immersing him in the waters of the River Styx. Unfortunately, she held him by the ankles or an ankle, and this part of his body was not rendered invulnerable. According to another version of the story Thetis sought to test the divinity of her new-born son, whose parentage was half-human, half-divine, by dipping him in boiling water. She discovered that he was completely immortal, except for the ankles.

It was from this legend that Philip Verheyen, Professor of Anatomy at the University of Louvain, first adopted in 1693 the anatomical term *chorda Achillis*, which was soon changed by Heister (*Compendium Anatomicum*, No. 174) to *Tendo Achillis*, or, in its anglicized form, "tendon of Achilles", to designate the powerful end tendon of the gastrocnemius and soleus muscles. Hyrtl² records Verheyen's adoption of the term and discusses briefly the history of the literature on the subject.

It will be observed that the legend, as we

know it, refers not to the strength of the heel of Achilles but to its weakness, whence vulnerability of any sort is figuratively referred to as an "Achilles' heel". On the other hand, the tendon of Achilles is in point of fact a particularly powerful one—"Tendo Achillis omnium fortissimus (Heister)." However, the name was thought appropriate because for many centuries wounds or bruises of the *tendo Achillis* were believed to be exceedingly serious. Hippocrates, who used a plural term (*neura megala*) for the tendon of Achilles, because several muscles are involved, says: "This tendon, if bruised or cut, causes the most acute fevers, induces choking (if not the death-rattle), deranges the mind, and at length brings death." Galen (*Comment.* II, Hipp. *Fractures* 17) remarks: "The bone of the heel is joined by nerves, which Hippocrates says are *ἐπιχαρπιοί*." Hippocrates used the term *ἐπιχαρπιοί* for dangerous or deadly wounds of the body. This tradition regarding the very sensitive nature of the *tendo Achillis* was strong enough to delay the introduction of tenotomy into the practice of surgery until comparatively recent times.

There is one other explanation of the name which is of interest only for antiquarian reasons. The verses of Homer (*Il.* XXII, 396 f) have been invoked, in which Achilles, about to drag the slain Hector behind his chariot, "pierced the tendons of both feet behind, from the heel to the ankle, and he pushed through ox-hide thongs and bound him from the chariot, and allowed his head to be dragged behind." This passage indicates that Homer knew the anatomical nature of the tendon, which is by no means surprising, but, as Hyrtl points out, if it had anything to do with the origin of the name, then it should be called the *tendo Hectoris*, and not the *tendo Achillis*, since the procedure was performed on the feet of Hector. It is, however, clear, from the writings of both Hippocrates and Galen, that the ancient Greeks did not think of the tendon of the heel in connection with Achilles at all. The introduction of the term into surgical literature is undoubtedly due to the classical education and the poetic imagination of the Professor of Surgery at Louvain.

I wish to acknowledge, in the preparation of this paper the assistance of my brother, Professor Herbert N. Couch of the Department of Classics, Brown University, Providence, R.I.

REFERENCES

1. For a full account with references see ROSCHER: *Ausführliches Lexikon der Griech. und Rom. Myth.*, s.v. Achilles, II, a. Geburt und früheste Jugend, pp. 23-26.
2. HYRTL: *Onomatologia Anatomica*, Wilhelm Bräunmüller, Vienna, 1880, p. 531.

Association Notes

The Annual Meeting

A MESSAGE FROM THE PRESIDENT-ELECT

Victoria, the far western outpost of the British Empire in Canada, will entertain the Canadian Medical Association at its Annual Session this month. The Association met here in 1926 and it is hoped this year's meeting will be as well attended as that of ten years ago.

This beautiful city, if running true to form, should welcome the visitors with summer weather, glorious sunshine, moonlight nights—in fact an ideal place for one to indulge in golf, swimming, riding, tennis, fishing, etc. Many beautiful gardens will be open for inspection, and of these Mr. and Mrs. R. P. Butchart's sunken gardens enjoy a world-wide reputation. For those who prefer a quiet time, the Empress Hotel and its picturesque gardens afford every comfort and pleasure. The Crystal Gardens and swimming-pool of sea-water will appeal to the imagination of visitors from inland places.

For the entertainment of our visitors the local Committees of physicians and their wives have arranged elaborate programs, taking the form of receptions, luncheons, cabarets, golf tournaments; visits to point of interest such as the Quarantine Station and the Dominion Astrophysical Observatory.

The scientific part of the meeting approaches the usual high standard attained in former years, as a reference to the list of speakers will substantiate. The names of those who have achieved international fame in clinical and laboratory investigation and discovery will be found in this list, and, we hope, will act as a magnetic attraction to the profession of our country and that of our cousins to the south.

The medical men of Victoria extend a hearty invitation to the Canadian Medical Association, and hope that after the Convention is finished all will be agreed that the mental food and relaxation provided have added to an abiding interest in and love for our profession.

HERMANN W. ROBERTSON

Victoria: This Year's Convention City

From 22nd to 26th of this coming June Victoria, the Capital City of Canada's most western province will be the scene of this year's Convention of the Canadian Medical Association.

The city's growing popularity as a Convention centre is well merited. Victoria is built in an exceptionally beautiful natural setting. It is bounded by the sea on three sides and on the fourth stretches out into a countryside of small

farms and homes, these merging further afield into the famous evergreen forests of Vancouver Island. Hotel accommodation is good, ample, and the rates are reasonable, while golf, fishing—fresh and salt water—yachting, motoring along winding country roads, and bathing can all be enjoyed within a few minutes' drive of the heart of the City. Full particulars and directions concerning all of these are given in the Association's Convention program.

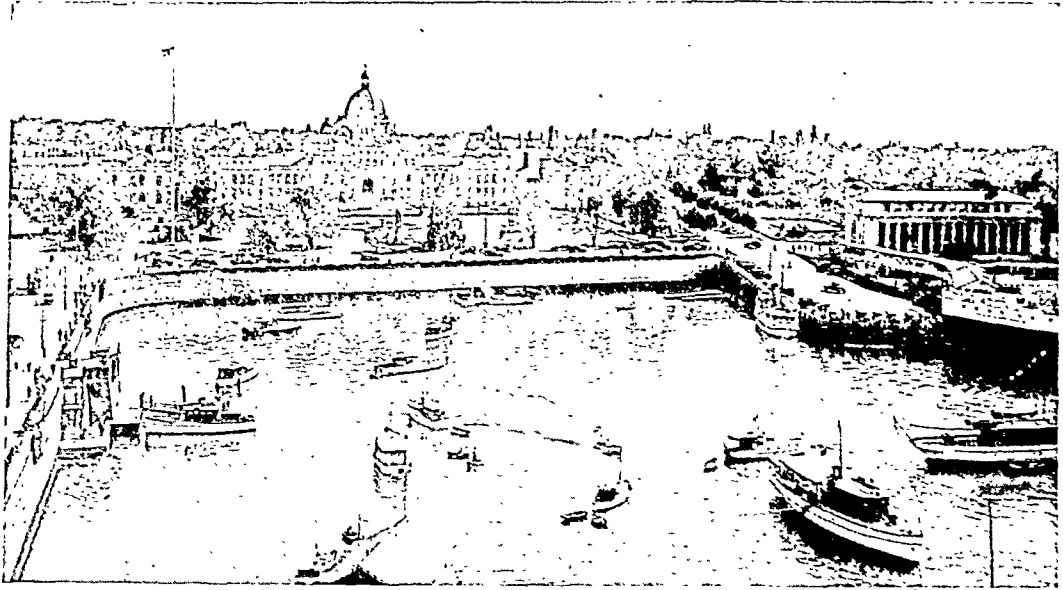
A city, like an individual, has to make up its mind as to what trade or profession it is going to follow as its main means of livelihood. Up to the present Victoria has, apparently, not been able to come to a final decision. Where else will you find a city which is essentially residential but which is also a world port, to which ships from all the seven seas come on their lawful occasions, and a growing and natural summer holiday resort! a far western city, but with a distinctly old country atmosphere; a city known throughout the world as very English, and yet which boasts the largest Burns Club in the world, not excluding Scotland itself; a city of a hundred contrasts and as many paradoxes; a city that has stubbornly refused to be standardized and persists in being itself and leading its own distinctive life.

In no particular is this difference more marked than when one considers Victoria's climate. The average summer day temperature is 61° Fahr., winter 42° Fahr., and rainfall less than 27 inches, over 16 inches of which falls during the winter months. The average annual sunshine is nearly six hours daily throughout the year. Victoria, in short, has no extremes of climate, no sand or dust storms, no blizzards, no earthquakes, no zero weather, and also no venomous snakes or other reptiles, and no deadly insects. This mild, all-the-year round, climate is the reason why so many people come to reside in the City under doctors' orders.

It was the British who discovered the island now known as Vancouver, on which Victoria stands, and stamped it for their own. Sir Francis Drake, in 1579, looked up the coast from California and in the lordly manner of those spacious times claimed all the territory to the north on the Pacific Coast for Queen Elizabeth. Under the name of New Albion. Captain James Cook visited Nootka on the west coast of Vancouver Island whilst sailing around the world in 1778, and Captain George Vancouver circumnavigated the island in 1792, being, incidentally, the first man to so do, and annexed it to Great Britain. It is true that some Spaniards had

sailed as far north and even planted a settlement at Nootka, but Spain did not make any great efforts to retain the island. After the departure of Captain Vancouver in 1792, except for the occasional visits of fur traders, the island was left in the possession of its native Indians until 1843, when the Hudson's Bay Company decided to move their fort from the State of Washington, which was then being transferred to American ownership, to British Columbia, and chose the site of the present city of Victoria, naming their fort after the great British Queen.

find came to Victoria from the Highlands of Scotland, or the shires of England, the blue-ridged mountains of Virginia, the coast of Maine, or the valley of the St. Lawrence. Victoria is, in short, at one and the same time one of the most insular and most cosmopolitan cities of its size on the North American continent. Yet it is essentially British. The winding streets, the houses that are homes, the walled-in, sheltered gardens, the tree-shaded country lanes where the motor car is never seen nor its noise heard, the tweeds and cheviots and good leather brogues and



Part of the Inner Harbour, showing the Parliament Buildings

Since that date succeeding waves of migration have swept up to Victoria — from the gold-fields of California to the gold-fields of the Cariboo; from Eastern Canada and the Canadian Prairie Provinces; from Great Britain, and from the European Settlements in the Orient. Of course, the waves receded, but in every instances they left a number of new residents. Many of these people naturally enough tried to change Victoria into a semblance of the cities they had come from. They did not succeed, but, on the other hand, Victoria did change them into Victorians. The man you stop to chat with on the cliffs in Beacon Hill Park, while looking at the royal swans in Elk Lake, admiring the luscious foliage resplendent with flowers in Mr. R. P. Butchart's sunken gardens, examining the old charts of the pioneers and discoverers in the Provincial Parliament Buildings, catching a forty-pound spring salmon in Brentwood Bay, playing golf in view of the snow-capped Olympic Mountains, fishing for steelhead in the swift Island rivers or for giant salmon in the bays and estuaries, browsing for rare volumes and antiques in the curiosity shops so reminiscent of Charles Dickens — the man, I say, that you speak to, thinking he is a native-born Islander, you will most probably

boots; the stiff-necked British race have not allowed climate to change their characteristics in any essential way. Or, perhaps we ought to say that the climate of Victoria is so similar to that of the southern counties of England that the race remains British here, just as it would have done if it had stayed in the shires of the Old Land.

People coming to Victoria naturally expect to find a pocket edition of the great cities of the Pacific Coast. Instead they discover a community different in a thousand and one aspects. That is why travellers fresh from sights and scenes in other lands will, in the majority of cases, agree with the lady who said, after seeing Victoria, "So different, but so very interesting and beautiful — yes, beautiful!"

You will notice that the first impression is one of difference, but the last, and obviously more lasting, one of beauty. So let us compress the whole description of Victoria into the two words — unique beauty. Or we can enlarge it into Mr. Rudyard Kipling's famous word picture, "To realize Victoria you must take all that the eye admires most in Bournemouth, Torquay, the Isle of Wight, the Happy Valley at Hong Kong, the Doon, Sorrento, and Camps Bay; add

reminiscences of the Thousand Islands and arrange the whole around the Bay of Naples, with some Himalayas for the background."

In most cities there is some unique feature which the sightseer naturally visits first, and which, therefore, becomes the focal point at which all tours begin. There are many such in Victoria. One might start, on historic grounds, from Bastion Street, for this was the site of the Hudson's Bay Fort from which the city grew. Or one might start from Clover Point on the Marine Drive, for it was here that Sir James Douglas landed in 1843 from the little steamer *Beaver*, to definitely establish a trading post for the Hudson's Bay Company at Victoria. But as the great majority of visitors enter by way

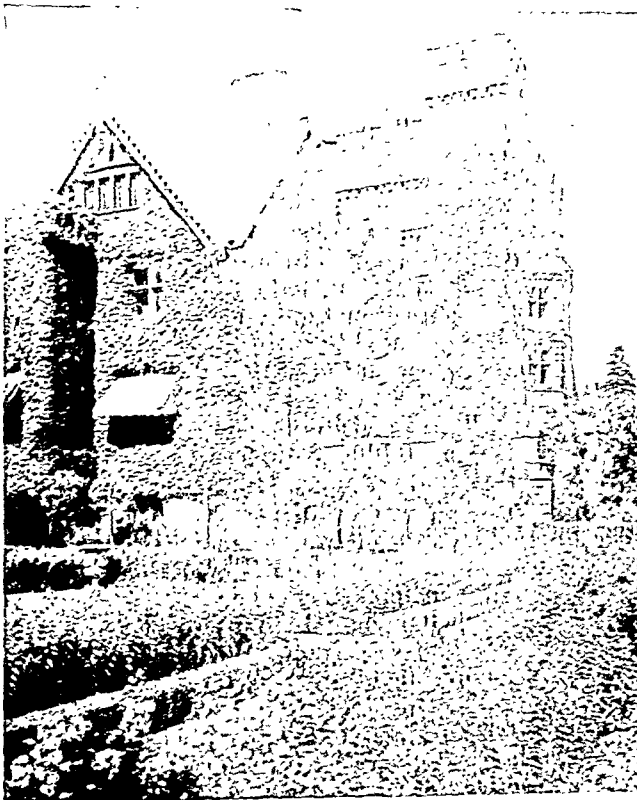
that soon began to grow up around the original fort. The third statue is Victoria's War Memorial, erected by the people of the city in memory of those soldiers who left here, 1914-1918, and made the supreme sacrifice in France. The base of this statue is of native British Columbia granite, the statue itself being the work of Sidney March, one of the seven March brothers of Farnborough, Kent, England, who designed war memorials for cities all over the Empire. The ground hedge bordering the driveway is of English ivy and was grown from slips. It has been kept closely clipped, and consequently the stems of the plant have climbed under and over and around one another until a living wall has been formed.

The first Parliament Buildings were erected in 1859, and consisted of five small detached pagoda-like erections scattered over the present site. The only one of these remaining faces Superior Street, and contains the Provincial Government Mineral Exhibit. The present buildings were completed in 1897 and formally opened in 1898. The grey stone used in the building came from Haddington Island, the granite steps and landings from Nelson Island, the slate on the roof from quarries in Jervis Inlet, all in British Columbia, while the marble used in the interior was brought from Italian quarries at Breccia, Paranzza and Verona. The particularly beautiful finishings and panelings in the committee rooms are of British Columbia birds-eye maple, cypress, fir, alder, cedar and spruce.

There is a fine natural history museum in the east wing, in which are specimens of practically all the fauna of British Columbia, while the Connaught or Provincial Library contains the best collection (over 190,000 volumes) in Canada west of Winnipeg. In the archives are numbers of original maps, charts and diaries, and logs of the discoverers and pioneers, not only of British Columbia but also of other parts of the Pacific Coast, and also many volumes dealing with the early history of the Pacific Northwest. Here, and in the Old Drill Hall on Menzies Street, are all sorts of Indian relics, from war canoes and massive totem poles to fishbone needles and stone arrow-heads.

The climb up the rather narrow steps to the gallery running around the outside of the base of the dome is well worth while, for from this vantage point a wonderful panoramic view of the city and surrounding country and the Straits and Gulf of Georgia, and, on a clear day, the distant coastline of the State of Washington, with the background of the eternally snowcapped Olympics and the Gulf Islands, is obtainable.

The statue on the top of the dome above our heads is that of Captain George Vancouver, of the British Navy, who was sent by the British

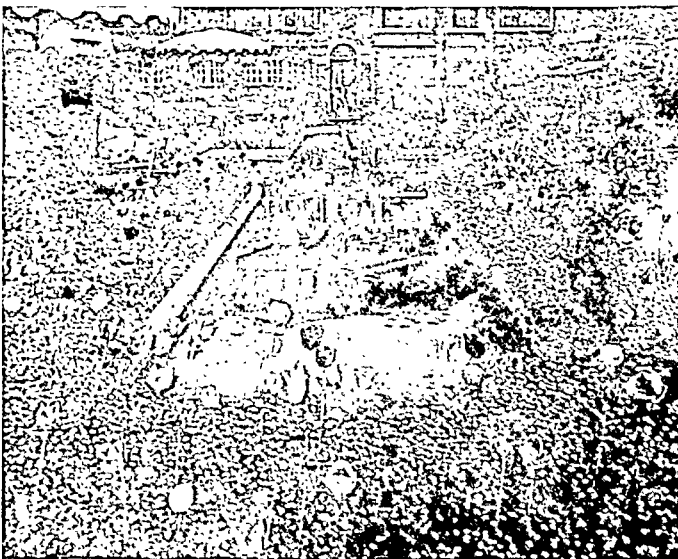


A private residence near Victoria

of the Canadian Pacific docks, practically in front of the Provincial Parliament Buildings, let us start our present wanderings there.

There are three statues on the grounds in front of the Buildings. The first, from west to east, is a statue of Queen Victoria, after whom the city was named. The inscription on the next monument reads: "Erected by the people of British Columbia to the memory of Sir James Douglas, K.C.B., Governor and Commander-in-Chief from 1851 to 1864". Not only was Sir James Douglas head of the Hudson's Bay Company at Victoria but his commanding personality and wise counsels dominated and guided the whole life of the young community

Government to take over Vancouver Island from the Spaniards in 1792, and was the first man to circumnavigate it. It was Captain Vancouver who, sailing up the Straits of Juan de Fuca in his ships, the *Chatham* and *Discovery*, charted and named practically all the waters and islands lying between Vancouver Island, the present State of Washington and the mainland of British Columbia, and also the majority of the bays and harbours and prominent landmarks on the mainland itself. To him we owe Puget Sound, Mount Rainier (14,408 feet high), the Gulf of Georgia—so named because Captain Vancouver discovered these waters on Monday, June 4, 1792, that being the anniversary of the birth of the then reigning English monarch, George III—Bellingham Bay, New Dungeness, Whidby Island, Mount Baker (10,827 feet high), Hood Canal, Howe Sound and Jervis Inlet.



Sunken Gardens at "Benvenuto", residence of Mr. R. P. Butchart

Looking toward the west, we see the Sooke Hills, hiding the settlement of that name and the open Pacific from us, and also sheltering the very pleasant farming districts of Metchosin and Colwood and Happy Valley from the prevailing south-westerly winds. For the same reason the sea lying under their lee, known as the Royal Roads, gives good free anchorage for large vessels. Following the coast line eastward towards Victoria we see Macaulay Plains, used chiefly in the past for military purposes. Here a fine nine-hole golf course awaits the visitor, this course being, by the way, the oldest in the Pacific Northwest. The wooden piers at the entrance to Victoria's Inner Harbour are the Rithet Docks, built in 1890, while the stone piers and breakwater (the latter being 2,750 feet in length) are known as Ogden Point Wharves, and were built by the Dominion Government, 1913-1917. These piers have a dockage depth of 40 feet, and were the only docks visited by the British Empire Special

Service Squadron in its trip around the world into which the largest ships then afloat, the *Hood* and the *Repulse*, were able to enter under their own steam and tie up alongside one another.

The district lying below us and bounded on the west by the entrance to Victoria Harbour, on the south by the sea, and on the east by Beacon Hill Park, is known as James Bay, named after Sir James Douglas. It is one of the older residential parts of the city, and is still deservedly popular.

That part of the Marine Drive running around the foreshore, the sea front of James Bay, and through Beacon Hill Park to Ross Bay, is Dallas Road.

Beacon Hill Park, 154 acres in size, was given to the city by the Provincial Government in 1882. It is a good specimen of the open park land commented on by the pioneers and early comers to Victoria. It possesses one of the magnificent stands of garry oaks which are such a noteworthy characteristic of Victoria, and which proclaim by their maximum size so far north the peculiar geniality of the city's climate. The park was originally a beautiful natural wild flower garden, but is now in many parts covered with broom. This was introduced in the early days and has spread not only over this park and into other parts of the city, but northward up the Island. The glory of its massed golden bloom during spring and early summer has been praised by countless visitors from all quarters of the globe, and has been accorded special mention in a hundred and one books of travel. The park owes its name to the fact that there were in the early days two beacons on the top of the hill which, when seen in a certain position, showed mariners Brothie's Ledge, now marked by a bell buoy. In earlier times, the aborigines used to erect poles and spread nets between them on this hill to snare birds in foggy weather. Today, the chief points of interest are Goodacres Lake, with the royal swans brought here from the King's reserves in Windsor, England, and other waterfowl; the nursery grounds, where young trees and shrubs are raised; the totem pole, which comes from the Haida tribe at Masset, Queen Charlotte Island; the Chinese Bell, brought from China at the time of the Boxer Rebellion; the tame Island deer, buffalo and *Ursus Kermadeci*, the unique white bear brought from the Princess Royal Island, and the only one of its species in captivity.

Following the shore line east of Beacon Hill Park is the Fairfield district, once devoted to farming and market gardens, today one of the better known residential sections. Many of the beautiful gardens that Victoria is famous for are to be found here. Adjoining are Ross Bay and Foul Bay in the order named, both covered with homes. Foul Bay, by the way, gets its name from the poor anchorage found there. The hill to the immediate east is Gonzales, one of

the few places on Vancouver Island named by the early Spanish discoverers in 1790. The western end of Gonzales Hill is occupied by the Dominion Meteorological Government Observatory and the Wireless Station. The observatory is one of the first landmarks picked up when approaching Victoria. It was erected in 1914. The main floor is devoted to the reception of weather reports from over 200 stations in British Columbia and the Yukon.

The bay immediately below the hill is named after Captain William H. McNeill, born in Boston, Mass., in 1803. He came to British Columbia in command of the American brig *Llama* in 1831, and made one of the earliest examinations of the coast while in command of the pioneer steamer *Beaver*. Almost adjoining is the famous Victoria Golf Club, famous for two reasons—first, for the wonderful view of the sea and mountains obtained from it, and ranked by many travellers as one of the seven finest views in the world; and also as the only course in the whole of North America where golf is played every day throughout the year.

Somebody once called Oak Bay district a "sea-side park of beautiful homes," and the description is so apt that it would be futile to try and improve or amplify it.

The next bay up the coast was named after the Hudson's Bay Company ship, the *Cadboro*. This inlet was the site of the village of the Songhee Indians prior to the building of Fort Victoria. An Indian defensive trench can still be seen on Spurn Head, and the Mystic Spring, famous in Indian legends, wells out from the ground at this point. In the Uplands residential district is another beautiful stand of the famous garry oaks, not only the stately pioneer trees, but the gnarled, distorted and fantastic rockland type.

Now having followed the compass round from west to north-east, let us bring our attention back to that part of the city lying immediately below us as we stand on the gallery outside the dome of the Parliament Buildings. The site of the Causeway

and the Empress Hotel and Crystal Gardens was, until 1904, a shallow continuation of the inner harbour, and at most tides a mud-flat. Indians say that in the early days the inner harbour ran in the form of a narrow creek through Fairfield, coming out to the sea at Ross Bay, and that at high tides they used to come through this way in their canoes from Ross Bay to Victoria. The first bridge, a wooden structure, was built across this neck of water (then called James Bay) in 1859. In



Malahat Scenic Drive

1904 the mud flats were filled in and the present causeway built, the Empress Hotel being opened in 1908. In order to make a secure foundation, the mud was pumped out and gravel dumped in, and great wooden piles, some ninety feet long, were driven down into the soil until bedrock was reached. The Crystal Gardens, built in 1925, and containing a great warm sea-water 150-foot swimming tank, private salt water baths, peacock promenades and dance rooms, and floral balconies, badminton courts, auditorium and bowling greens, is built on a massive reinforced concrete mattress spread on the ground.

It was on the banks of the West Arm of the Inner Harbour, that narrowing stretch of water running inland as far as the eye can see, that the City of Victoria was born. On the west shore, now covered with factories, was the Songhees' Reserve, where that tribe of Indians made their home after the building of Fort Victoria. It was also the camping ground of large numbers of other Indians from up-island points come down to trade with the Hudson's Bay Company. On the Gorge at the head of

this arm was the Hudson's Bay farm. Here the first sawmill was erected, the first school built, and the first Island bricks made. On the east shore, the present site of Bastion Street, about a quarter of a mile from us, was the Fort itself. It was built in 1843 and stood until 1860. The original fort had two bastions, one at the north and one at the south corner, covered an acre of land, and was enclosed by palisades.

Of special interest outside the city boundaries are the Sunken Gardens at Benvenuto, Mr. R. P. Butchart's country home, twelve miles from Victoria; the Dominion Government Astronomical Observatory containing the second largest telescope of its kind in the world (8 miles distant); the Dominion Government Experimental Farm in Saanich (16 miles distant); and the Malahat Mountain Drive, rising to over 1,250 feet above the sea, 18 miles north of the city.

J. H. MOORE,

*Chairman of the Local
Committee on Publicity.*

PROGRAM FOR THE SIXTY-SEVENTH ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION, TO BE HELD IN VICTORIA, B.C., ON

JUNE 22, 23, 24, 25, 26, 1936

Convention Headquarters, Empress Hotel

Monday, June 22nd

- 9.00 a.m.—Registration.
- 9.30 a.m.—Meeting of Council.
- 12.30 p.m.—Luncheon—Members of Council to be Luncheon Guests of the President-Elect, Dr. H. M. Robertson.
Valedictory Address of the President, Dr. J. C. Meakins, Montreal.
- 2.00 p.m.—Meeting of Council.
- 4.00 p.m.—Tea and Reception—Hostesses, Mrs. Norman Yarrow and Mrs. J. W. Spencer.
- 5.00 p.m.—Meetings of Committees.
- 6.00 p.m.—Meeting of Nominating Committee.
- 9.00 p.m. to 1.00 a.m.—Dancing and Bridge, Empress Hotel.

Tuesday, June 23rd

- 9.30 a.m.—Meeting of Council.
- 12.30 p.m.—Luncheon.
- 2.00 p.m.—Meeting of Council.
- 2.15 p.m.—Official Opening of Exhibit Hall.
- 3.00 p.m.—Garden Party at "Benvenuto", the home of Mr. and Mrs. R. P. Butchart.

Tuesday, June 23rd—Continued

- 4.00 p.m.—Annual Meeting of the British Columbia Medical Association.
- 5.00 p.m.—Annual Meeting of the Canadian Medical Protective Association.
- 7.00 p.m.—Members of the Council of the Canadian Medical Association and the British Columbia Medical Association to be guests of the British Columbia Medical Association and the Victoria Medical Society at dinner at the Empress Hotel.
- 9.00 p.m.—Annual Meeting of the College of Physicians and Surgeons of British Columbia.

Wednesday, June 24th

- 8.30 a.m.—Registration.
- 9.00 a.m.—General Session in the Ball Room.
- 12.15 p.m.—Official Photograph of the Convention.
- 12.30 p.m.—Luncheon.
- 2.00 p.m. to 5.00 p.m.—Sectional Meetings.
- 4.00 p.m. to 6.00 p.m.—Garden Party at Mrs. James Dunsmuir's home, "Hatley Park".

Wednesday, June 24th—Continued

8.30 p.m.—Annual General Meeting, to which all members and their ladies, guest speakers and official delegates are invited.
Music.

9.00 p.m.—Call to Order by the President.
— Invocation.
— Introduction of Guest Speakers and Official Delegates.
— Presentation of Frederic Newton Gisborne Starr Award to Sir Frederick Banting. Dr. Charles Best, and Dr. J. B. Collip.
— Announcement of Fellowships.
— Installation of the President.
— Address of the President.
— Reception by the President and Mrs. Robertson, to be followed by dancing, cards and refreshments.

Thursday, June 25th

9.00 a.m. to 12.00—Sectional Meetings.
12.30 p.m.—Luncheon.
2.00 p.m. to 5.00 p.m.—General Sessions.
2.00 p.m.—Meeting of incoming Executive Committee.
4.00 p.m.—Dr. and Mrs. Hermann M. Robertson's Reception and Garden Party at "Clovelly", the home of Lady Barnard.
9.30 p.m. to 1.00 a.m.—Cabaret Supper and Dance.

Friday, June 26th

9.00 a.m. to 12.00 noon—General Sessions.
12.30 p.m.—Luncheon.
2.00 p.m.—Annual Golf Tournament for The Ontario Cup.
5.00 p.m.—Reception at Government House (informal).
7.00 p.m.—Alumni Dinners and Class Reunions.

GENERAL SESSIONS

Place of Meeting—Ball Room, Empress Hotel

Wednesday, June 24th

9.00 a.m. Primary tumour of bone (Lantern Demonstration).—Dr. A. T. Bazin, Montreal;
Results in the medical treatment of gastric ulcer.—Dr. E. E. Cleaver, Toronto;
Curability of cancer of the stomach.—Dr. Verne Hunt, Los Angeles, Calif.;

Wednesday, June 24th—Continued

Tumours of the upper urinary tract.—Dr. F. S. Patch, Montreal;
The present trend in anæsthesia.—Dr. Beverley C. Leech, Regina;
Embolism and thrombosis of the larger arteries; their diagnosis and treatment.—Dr. Duncan Graham, Toronto.

Thursday, June 25th

2.00 p.m. Silicosis research.—Sir Frederick Banting, Toronto;
Methods of administration of hormones with special reference to protamine insulin.—Dr. Charles Best, Toronto;
The significance of recent investigations on the ductless glands.—Dr. J. B. Collip, Montreal;
Diverticulitis of the sigmoid colon.—Dr. R. R. Graham, Toronto;
A review of some aspects of the surgery of the sympathetic nervous system.—Dr. John Gunn, Winnipeg;
The medical treatment of ringworm of the scalp.—Dr. D. E. H. Cleveland, Vancouver.

Friday, June 26th

9.00 a.m. A practical consideration of the mineral and vitamin requirements of man.—Dr. F. F. Tisdall, Toronto;
Mortality and morbidity in acute appendicitis.—Dr. Gordon Fahrni, Winnipeg;
Vascular episodes.—Dr. E. L. Pope, Edmonton;
The treatment of carcinoma of the cervix.—Dr. Jas. C. Masson, Rochester;
The Lister Oration.—Dr. E. W. Archibald, Montreal.

SECTIONAL MEETINGS

(Note: All members and visitors who have registered are eligible to attend any of the Sectional Meetings).

Section of Ear, Nose and Throat**Wednesday, June 24th**

2.00 p.m. A discussion of septicæmia and sinus thrombosis.—Dr. A. T. Wanamaker, Seattle;
2.30 p.m. Results of radical antral operations.—Dr. G. C. Draeseke, Vancouver;

Wednesday, June 24th—Continued

- 3.00 p.m. Measured blood loss in certain nose and throat operations.—Dr. F. D. McKenty, Winnipeg;
- 3.30 p.m. Endoscopy with report of two hundred cases.—Dr. A. D. McCannel, Minot, N.D.;
- 4.00 p.m. Effects of the pituitary upon atrophic rhinitis and otosclerosis.—Dr. Percy Wright, Montreal.

Section of Medicine**Wednesday, June 24th**

- 2.00 p.m. Myxædema: some common errors in its diagnosis and treatment.—Dr. H. D. Kitchen, Winnipeg;
- 2.30 p.m. Interpretation of heart symptoms.—Dr. H. H. Jennings, Calgary;
- 3.00 p.m. The interpretation of some common digestive symptoms.—Dr. J. W. Scott, Edmonton;
- 3.30 p.m. Epilepsy in general practice.—Dr. R. G. Armour, Toronto;
- 4.00 p.m. Our present position with regard to psoriasis.—Dr. Harold Orr, Edmonton.

Thursday, June 25th

- 9.00 a.m. Prognosis in coronary thrombosis.—Dr. G. F. Strong, Vancouver;
- 9.30 a.m. Peripheral vascular disease.—Dr. J. M. McEachern, Winnipeg;
- 10.00 a.m. Intestinal absorption in its relation to allergy.—Dr. Robert L. Benson, Portland, Ore.;
- 10.30 a.m. Some observations from the chest examinations of 40,000 people.—Dr. W. H. Hatfield, Vancouver;
- 11.00 a.m. Functional disorders of the colon.—Dr. E. P. Scarlett, Calgary;
- 11.30 a.m. Silicosis.—Dr. C. H. Vrooman, Vancouver.
- Environment and the neuroses (to be read by title).—Dr. Ruth Mac-lachlan Franks, Toronto.

Section of Military Medicine**Thursday, June 25th**

- 12.30 p.m. Luncheon—to be followed by these papers:
The importance of medical military documentation and its relation to pension matters.—Col. Fred C. Bell, C.M.G., D.S.O., Ottawa;
The treatment of wounds in French hospitals.—Major J. L. Petitclerc, C.A.M.C., O.C., Quebec.

Section of Obstetrics and Gynæcology**Wednesday, June 24th**

- 2.00 p.m. Chairman's Address.—Dr. J. R. Fraser, Montreal;
- 2.30 p.m. Further experience in amnesia and analgesia in obstetrics.—Dr. L. C. Conn, Edmonton;
- 3.00 p.m. Discussion.
- 3.15 p.m. The present status of endocrine therapy in gynæcological and obstetrical problems.—Dr. A. D. Campbell, Montreal.
- 3.45 p.m. Discussion.

Thursday, June 25th

- 9.00 a.m. External cephalic version.—Dr. F. G. McGuinness, Winnipeg;
- 9.30 a.m. Discussion.
- 9.45 a.m. Rheumatic heart disease and pregnancy.—Dr. D. N. Henderson, Toronto;
- 10.15 a.m. Discussion.
- 10.30 a.m. A personal series of hysterectomies and myomectomies, with a comparison of results of total hysterectomies vs. supra-vaginal hysterectomies and some points in technique.—Dr. J. J. Mason, Vancouver;
- 11.00 a.m. Discussion.
- 11.15 a.m. Endometrial hyperplasia.—Dr. Murray Blair, Vancouver;
- 11.45 a.m. Discussion.

Section of Ophthalmology**Thursday, June 25th**

- 9.00 a.m. Clinical demonstration—cases—apparatus.
- 10.00 a.m. Conjunctival melanomata.—Dr. A. E. MacDonald, Toronto;
- 10.30 a.m. Essentials in the treatment of detached retina.—Dr. W. G. M. Byers, Montreal.
- 11.00 a.m. Practical perimetry: construction and operation of tangent screen.—Dr. A. J. McLean, Portland, Ore.

Section of the North Pacific Pædiatric Society in Conjunction with the Pædiatric Section of the Canadian Medical Association**Wednesday, June 24th**

- 9.00 a.m. A case of Hirschsprung's disease.—Dr. W. E. M. Mitchell, Victoria;
- 9.30 a.m. A case of Addison's disease.—Dr. R. A. Hunter, Victoria;

Wednesday, June 24th—Continued

- 10.00 a.m. Two unusual cases of congenital heart malformation.—Dr. Glenn Simpson, Victoria;
- 10.30 a.m. The adrenal cortex in relation to conditions in childhood.—Dr. N. Kemp, Vancouver;
- 2.00 p.m. Foot deformities in childhood and their treatment.—Dr. K. J. Haig, Vancouver;
- 2.30 p.m. Survey of congenital syphilis in Vancouver.—Dr. E. J. Curtis, Vancouver;
- 3.00 p.m. Fatigue in children.—Dr. George E. Lamont, Vancouver;
- 3.30 p.m. Indications for antitoxin and toxoid therapy in osteomyelitis.—Dr. C. E. Dolman, Vancouver.

Thursday, June 25th

- 9.00 a.m. Mental hygiene in relation to infants and children.—Dr. R. P. Kinsman, Vancouver;
- 9.30 a.m. Measles encephalitis.—Dr. Harold W. Price, Calgary;
- 10.00 a.m. Basal anaesthesia in children's surgery.—Dr. Herbert E. Coe, Seattle;
- 10.30 a.m. Intracranial hemorrhage of the newborn.—Dr. Urban J. Gareau, Regina.

Section of Radiology**Wednesday, June 24th**

- 2.00 p.m. Chairman's address.—Dr. B. J. Harrison, Vancouver;
- 2.30 p.m. Quality of roentgen rays, its measurement and importance (Discussion).—Dr. R. R. Newell, Stanford University;
- 3.00 p.m. Common errors in the diagnosis and treatment of malignancy.—Dr. E. E. Shepley, Saskatoon;
- 3.30 p.m. Discussion on the radiotherapeutical care of breast cancer.—Dr. C. M. Henry, Regina;
- 4.00 p.m. Discussion on the relationship of the roentgenologist and the hospital.—Dr. B. J. Harrison, Vancouver.

Thursday, June 25th

- 9.00 a.m. The roentgenographic image of bone lesions (Discussion).—Dr. C. G. Sutherland, Rochester;
- 9.30 a.m. Some of the limitations of x-ray (Discussion).—Dr. Bernard Mooney, Edmonton;

Thursday, June 25th—Continued

- 10.00 a.m. X-ray treatment of the tonsils (Discussion).—Dr. Walter Morrish, Edmonton;
- 10.30 a.m. Discussion on radiotherapeutical care of cancer of the uterus.—Dr. W. H. McGuffin, Calgary.

Section of Surgery**Wednesday, June 24th**

- 2.00 p.m. Breast cancer.—Dr. M. R. MacCharles, Winnipeg;
- 2.45 p.m. Sequelæ of head injury.—Dr. Frank Turnbull, Vancouver;
- 3.30 p.m. Institutional care in the treatment of poliomyelitis.—Dr. F. H. Newburn, Edmonton;
- 4.15 p.m. Thoracoplasty: report of cases.—Dr. J. S. Burris, Kamloops.

Thursday, June 25th

- 9.00 a.m. Acute pancreatitis.—Dr. P. H. T. Thorlakson, Winnipeg;
- 9.45 a.m. Apical pulmonary tuberculosis with conservation of healthy lung.—Dr. Emile Holman, San Francisco;
- 10.30 a.m. Incision for difficult splenectomy.—Dr. Lyon Appleby, Vancouver;
- 11.15 a.m. Our experience with the hormone treatment of the adenomatous prostate.—Dr. R. A. McComb, Toronto.

Section of Urology**Wednesday, June 24th**

- 2.00 p.m. Present status of prostatic surgery.—Dr. Lee Smith, Vancouver.
- 2.30 p.m. Bilateral renal calculi; the problem recurrence.—Dr. A. B. Hepler, Seattle;
- 3.00 p.m. Congenital polycystic kidneys.—Drs. F. S. Patch and John Davidson, Montreal.

General Information**Railway Certificates**

Identification Certificates are available for those desiring them. Please write the General Secretary if you wish one; but before purchasing your transportation check with your local ticket agent regarding comparative costs under the Summer Tourist rate and the rate you would secure by using the Identification Certificate.

Hotel Accommodation

Empress Hotel.—Single room with bath, \$4.00; double room with bath, \$6.00.

Dominion Hotel (About 7 city blocks from headquarters).—Single room without bath, \$1.50; double room without bath, \$2.50; single room with bath, \$2.50; double room with bath, \$3.50. Weekly rate as above, less one day deduction. Meals: breakfast, from 25c.; luncheon, from 50c.; dinner, from 60c.; also à la carte.

Oak Bay Beach Hotel (About 3 miles from headquarters—transportation each morning included in rates).—Single room with bath and breakfast, \$4.00; double room with bath and breakfast, \$6.00; twin beds with bath and breakfast, \$7.00. Meals: breakfast, 75c.; luncheon, 1.00; dinner, 1.25.

Strathcona Hotel (About 2 city blocks from headquarters).—One person with use of bath, \$1.50; two persons with use of bath, \$2.00; one person with private bath, \$2.00; two persons with private bath, \$3.00; twin beds with bath, \$3.50 and \$4.00. Weekly rates.—Single with use of bath, \$7.00; double with use of bath, \$10.00; single with private bath, \$10.00; double with private bath, \$15.00.

Glenshiel Hotel (About 2 city blocks from headquarters).—Single room without bath, \$1.50; double room without bath, \$2.50; single room with bath, \$2.50; double room with bath, \$3.50. Weekly rates as above, less one day deduction.

Windermere Hotel (About 3 city blocks from headquarters).—Single room without bath, from \$1.50; single room with bath, \$3.00; double room without bath, from \$2.50; double room with bath, \$4.00. Weekly rate as above, less one day deduction. Meals, breakfast, 50c.; luncheon, 50c.; dinner, 75c.

James Bay Hotel (About $\frac{3}{4}$ mile from headquarters).—Single room without bath, \$1.50; double room without bath, \$2.50; single room with bath, \$2.00; double room with bath, \$3.00. Weekly rates as above less one day deduction. Meals: breakfast, 25c.; luncheon 50c.; dinner, 75c.

Douglas Hotel (About 10 city blocks from headquarters).—Single room without bath, \$1.25 to \$1.50; single room with bath, from \$2.00; double room without bath, \$2.00; double room with bath, \$3.00. Weekly rates.—Single room without bath, \$5.00; single room with bath, from \$10.00; double room without bath, from \$8.00; double room with bath, \$15.00. Meals: breakfast, 25c. and up; luncheon, 25c. and up; dinner, 35c. and up.

REGISTRATION

The Registration Desk will be in the Ball Room Foyer of the Empress Hotel.

Badges for members will be issued on Registration.

The members of the Victoria Medical Society will wear Blue Ribbon Badges.

The members of the Council will wear Red Ribbon Badges.

Visiting ladies will register in the Ladies' Reception Room. They will be supplied with a convention badge and will be given programs containing full information regarding entertainments and functions.

The Ladies' Committee will wear White Ribbon Badges with "Ladies' Committee" printed thereon.

EXHIBITS

All Commercial Exhibits will be placed in the Foyer of the Empress Hotel.

The official opening of the Commercial Exhibits will take place on Tuesday, June 23rd, at 2.15 o'clock.

The Local Committee requests that Exhibitors be given the encouragement they deserve.

LUNCHEONS AND DINNERS

Luncheons for members will take place daily at 12.30 p.m. in the Empress Hotel.

Tickets for these luncheons will be \$1.00 and may be obtained from the cashier at the front office.

There will be no C.M.A. Annual Dinner.

There will be a Cabaret Supper Dance on Thursday at 9.30 p.m.

Alumni Dinners will be held on Friday evening at 7.00 p.m., when all graduates of Canadian universities will attend as college units. American visitors, not graduates of Canadian universities, will be welcome at any of these dinners.

A Ladies' Dinner will be held in the Grill Room of the Empress Hotel on Friday, June 26th, at 7.30 p.m.

ANNUAL GENERAL MEETING

The Annual General Meeting will be held in the Ball Room of the Empress Hotel on Wednesday evening, commencing at 8.30 p.m. This will include the presentation of Awards and Fellowships, the Installation of the new President, and will be followed by the President's Reception and a Dance.

GOLF

The Annual Golf Tournament of the Canadian Medical Association will be held at the Victoria Golf Club on Friday, June 26, 1936.

The program is as follows:—

1. The Ontario Cup—will be 18 holes medal round with full handicap allowance (limit 24). Winner receives Ontario Cup for one year and a miniature; prize for runner-up; prize for best gross score; prize for runner up.

2. An endeavour will be made to have international and interprovincial team matches at the same time.

There are four 18-hole golf courses and one 9-hole golf course and playing privileges will be extended to the visiting members and guests of the Canadian Medical Association.

Final arrangements, starting time, transportation, etc., will be announced during the convention.

TENNIS

By courtesy of the Victoria Lawn Tennis Club excellent courts are available for the game. Kindly enquire at the desk.

BOWLING, RIDING, SWIMMING, FISHING (trout and salmon) will be available to those who wish.

CRYSTAL GARDEN

The Crystal Garden and its salt water swimming pool should prove popular. Special terms have been arranged for this meeting. Tickets may be secured at the Crystal Garden.

QUARANTINE STATION AND LEPER COLONY

Through the kindness of the Minister of the Department of Pensions and National Health and Dr. H. E. Tremayne, Quarantine Officer-in-charge, small parties are invited to visit William Head and the Leper Colony on B. Rock Island. Those interested are asked to enquire at the Registration Desk.

ASTRO-PHYSICAL OBSERVATORY

Many visitors will be interested in visiting the Astro-Physical Observatory on Little Spanish Mountain. Arrangements have been made through the courtesy of the Director, Dr. W. E. Harper, for a party to visit the Observatory on Thursday evening. Those wishing to do so will please register for this trip, and transportation will be provided.

ENTERTAINMENT

Members and visitors are requested to register early and to signify the entertainment features which they wish to attend.

4.00 p.m. Monday—Tea and Reception at Mrs. Norman Yarrow's and Mrs. J. W. Spencer's.

9.00 p.m. Monday—Dance and Bridge at the Empress Hotel.

3.00 p.m. Tuesday—Garden Party at Mr. and Mrs. R. P. Butchart's famous Sunken Gardens.

7.00 p.m. Tuesday—Annual Dinner to the Council of the Canadian Medical Association and British Columbia Medical Association.

4.00 p.m. Wednesday—Garden Party at Mrs. James Dunsmuir's.

9.00 p.m. Wednesday—Annual General Meeting of Canadian Medical Association.

4.00 p.m. Thursday—Dr. and Mrs. Hermann M. Robertson's Reception and Garden Party at "Clovelly", the home of Lady Barnard.

9.30 p.m. Thursday—Cabaret Supper and Dance.

2.00 p.m. Friday—Annual Golf Tournament.

5.00 p.m. Friday—Reception at Government House.

7.00 p.m. Friday—Alumni Dinners.

CANADIAN MEDICAL PROTECTIVE ASSOCIATION

The Canadian Medical Protective Association will hold its Annual Meeting on Tuesday at 5.00 p.m. All members are urged to attend. The Officers are: *President*, Dr. J. Fenton Argue, Ottawa; *Secretary-Treasurer*, Dr. T. L. Fisher, Ottawa.

ACKNOWLEDGMENTS

The Canadian Medical Association wishes to express its sincere thanks and appreciation for kindly favours extended by the following, who have assisted very materially towards the successful carrying out of this Convention: The Honourable The Premier, Mr. T. D. Pattullo; His Worship Mr. David Leeming, Mayor of Victoria; Lady Barnard; Mr. and Mrs. R. P. Butchart; Mrs. James Dunsmuir; Dr. W. E. Harper; the Victoria and Vancouver Island Publicity Bureau; the Victoria Golf Club; the Colwood Golf and Country Club; the Uplands Golf Club; the Esquimalt Golf Club; the Gorge Vale Golf Club; the Victoria Lawn Tennis Club; the Canadian Pacific Railway Company; the Canadian National Railways; the *Victoria Daily Colonist*; the *Victoria Daily Times*.

Ladies' Program

Monday, June 22nd

4.00 - 6.00 p.m.—Tea and Reception, Hostesses, Mrs. Norman Yarrow and Mrs. J. W. Spencer.

9.00 p.m. - 1.00 a.m.—Dance and Bridge, Empress Hotel.

Tuesday, June 23rd

3.00 p.m.—Garden Party at "Benvenuto", the home of Mr. and Mrs. R. P. Butchart.

9.00 p.m.—Bridge Tournament, Empress Hotel.

Wednesday, June 24th

1.00 p.m.—Luncheon at Oak Bay Golf Club.

4.00 to 6.00 p.m.—Garden Party at "Hatley Park", the home of Mrs. James Dunsmuir.

Wednesday, June 24th—Continued

8.30 p.m.—Music—Empress Hotel.

9.00 p.m.—Annual General Meeting, Empress Hotel.

Thursday, June 25th

4.00–6.00 p.m.—Dr. and Mrs. Hermann M. Robertson's Reception and Garden Party at "Clovelly", the home of Lady Barnard.

9.30 p.m.—1.00 a.m.—Cabaret, Empress Hotel.

Friday, June 26th

Golf Tournament and Tea, Oak Bay Golf Club.

5.00 p.m.—Reception at Government House (informal).

7.30 p.m.—Dinner, Music and Bridge, Empress Hotel.

Mornings

10.00–12.00 a.m.—Arrangements will be made for tennis, golf, riding, rides, swimming, fishing and viewing gardens.

REGISTRATION

A room at the Empress Hotel will be reserved for the use of ladies attending the Convention. All ladies are asked to register there on their arrival and to indicate as early as possible which of the morning, afternoon, and evening arrangements they will be able to attend; in this way transportation and other details will be much facilitated and long delays avoided.

The Ladies of the Reception Committee will be in the Ladies' Room at the following times: Monday—9.30 a.m. to 12 noon. Tuesday—9.30 a.m. to 4 p.m. Wednesday—9.30 a.m. to 4.00 p.m. Thursday—9.30 a.m. to 3.00 p.m. Friday—9.30 a.m. to 4.00 p.m. They will distribute Convention Badges at the time of registration, and will be pleased to give any information about the Convention, Program, or such matters as the best shopping centres, the whereabouts of good oriental stores or such points of interest as the Parliament Buildings, its museum, archives, etc.

MORNING PROGRAM

Committee members will be in the Ladies' Room at the Empress Hotel each morning from 9.30 to 10.30 a.m. to arrange for parties, matches, transport, etc., etc.

GARDENS

Arrangements have been made by the Committee in conjunction with members of Victoria's Horticultural and Rock Garden Societies for visitors to see some of the loveliest private gardens.

GOLF

All ladies wearing the Convention Badge will be admitted to the local golf courses. Twosomes, foursomes, and transportation to the more distance courses, such as Colwood, can be arranged with members of the Golf Committee.

TENNIS

The Victoria Tennis Club is giving free use of its courts to members of the Convention. The Committee will be pleased to make arrangements for games.

RIDING

The riding schools in the district have been approached that satisfactory horses may be reserved for Convention members. Good stretches of turf can be found in Uplands and Beacon Hill Park.

SWIMMING

The swimming pool at the Crystal Gardens is one of the finest on the West Coast. Tickets at a reduced rate may be obtained by Convention members wearing their Badges from members of the Swimming Committee.

FISHING

Within a few miles of Victoria excellent fishing is available. Transportation and arrangements may be made through the fishing committee.

A Criticism of the Constitution and By-laws of the Proposed Federation of the Canadian and Provincial Medical Associations

As a past-president of the Ontario Medical Association I wish to offer some comments on the draft constitution and by-laws of the proposed federation of the provincial associations with the Canadian Medical Association. While I am in sympathy with the desire to establish a representative national medical organization along federal lines I do not believe that this desirable object will be attained under the plan now submitted for consideration.

Apparently the committee of the Canadian Medical Association recognizes that it is essential for the success of the proposed organiza-

tion to build up the membership of the constituent associations, and I agree entirely with this conclusion. I am, however, opposed on principle to any suggestion of compulsory membership, or to the collection of Association fees by the College of Physicians and Surgeons, or of doing anything else that may jeopardize the existence or impair the usefulness either of the Ontario Medical Association or the College. Any attempt at compulsion or coercion of the medical profession may seriously undermine the loyal support which has been voluntarily accorded, in increasing degree, to both the Ontario Medical Association and the Canadian Medical Association by the doctors of this province.

A careful study of the draft constitution and by-laws makes it readily apparent that control of the proposed organization and ultimately of the medical profession of Canada, in most of its important activities, is to be vested almost entirely in the hands of a small executive committee of the Canadian Medical Association or a quorum thereof. I do not believe that any committee either acting alone or in conjunction with one of the provincial associations should be given authority to speak for the organized medical profession of Canada.

The annual meetings of the Canadian Medical Association are really meetings of its executive body with one of the nine provincial associations, at which meetings there is present only a sprinkling of the membership of the eight other provincial associations. In the intervals between meetings a *quorum* (5) of the executive of the Canadian Medical Association functions independently of any general control whatever, and yet assumes to speak and act for the organized medical profession of Canada.

Under the proposed constitution the executive committee is in large measure permanent and self-perpetuating, and its members are reimbursed for their expenses for attendance at meetings. I am offering no criticism of the payment of the expenses of the executive committee, but am mentioning it only to point out that the members of the proposed General Council and of other committees of the Canadian Medical Association, whose expenses are not paid, judging by past experience, will not attend the meetings of the Canadian Medical Association in large numbers *outside their own province*, and therefore the powers on paper accorded the representatives of the provincial associations will remain largely unexercised.

The proposed plan of organization does not provide for a federation of autonomous provincial associations to form a national organization, but rather, as before stated, for meetings of the executive of the Canadian Medical Association with one of the provincial associations, which obviously is not a meeting repre-

sentative of the Canadian medical profession. A representative meeting of the whole medical profession of Canada could be brought about under an organization providing for a Congress of the provincial associations, held at intervals of three, four or five years, at such central points as Winnipeg, Ottawa or elsewhere, and this, I suggest, should be considered as a guiding principle for the organization of a national body.

The Ontario Medical Association has had a long history of service in the interests of the profession of the province, and for many years has been closely affiliated with the national association. If the proposed constitution and by-laws come into effect, the members of the Ontario Medical Association, in addition to payment of the provincial fee, will have to undertake the collection of a fee of \$8.00 from some 700 of its members, who are non-members of the Canadian Medical Association, or will have to drop from membership in the Ontario Medical Association those who do not wish to pay the fees for membership in both associations. It is quite probable that many of the present members of the Ontario Medical as well as other provincial associations, may prefer to take advantage of the provision in the proposed constitution and by-laws, to become members of the Canadian Medical Association directly and receive the *Association Journal*, and drop their membership in the provincial associations entirely. This is a matter for serious consideration, for it is obvious that a strong united national organization cannot be built on division or on weakening of the constituent provincial bodies.

On the other hand a Congress of the provincial associations could be provided for, without the autonomy or interests of the provincial associations being compromised, and a national organization on such basis would constitute a real federation — a representative Canadian Medical Association. The executive committee then could function at and in the intervals of meetings, largely as at present, but without assuming to speak for the Canadian profession except after the approval of their actions by the provincial associations or their executives.

If the proposed constitution is adopted by the provinces the result will be not a federation at all but rather an organic union or merger in which the ultimate power and authority will be vested in the executive of the Canadian Medical Association consisting of thirteen members elected by the General Council, and seven *ex officio*, with a quorum of five practically in control.

Apparently there is a strong sentiment in favour of a real federation, preserving provincial autonomy, and it will be unfortunate if hasty action is taken before sufficient time and

opportunity has been afforded for a careful study of the question by constituent associations and societies. A satisfactory constitution for a confederation as far as possible should be uniform for all the provinces and should be formally approved by all before it comes into effect in any province. Dr. McEachern evidently had this principle in mind when he stated that "the plan in its final form must be acceptable to the provinces, or of course it will not be adopted." In my opinion the admission of Alberta to the Canadian Medical Association under conditions not yet approved by other provinces was a serious mistake in procedure.

A federation such as I have suggested is evidently what the organizers of the Canadian Medical Association had in view following the confederation of the provinces in 1867. Confederation provided for a proportionate representation of the provinces in a federal parliament and not for meetings of an executive of the federal government, with one of the provincial legislatures undertaking to legislate for the whole Dominion, and the provinces were designated as such by their own names and not as "divisions" of the Dominion of Canada. A satisfactory federation should recognize the important and equitable principle enunciated by Dr. McEachern in 1934 when the suggestion of a federation of the provincial associations with the Canadian Medical Association was first brought forward, *viz.*, "if and when the plan is adopted nationally, it will not in any way interfere with provincial autonomy nor will it permit of any outside interference in provincial matters."

Notwithstanding this assurance, and also Article XIV of the proposed constitution that "no provision of the constitution or by-laws . . . shall interfere with the status of a division as a provincial organization", may I direct attention to the powers accorded two of the committees provided for and to be appointed by the executive of the Canadian Medical Association, *viz.*, the Committee on Legislation (Chapter VIII, Section 2) and the Committee on Economics (Chapter VIII, Section 10).

SECTION 2—COMMITTEE ON LEGISLATION

"All matters relating to medical legislation, *federal or provincial*, and all matters requiring legislative action (made or contemplated) arising within the Association or any of its branches, or any of its committees, shall be referred to the Committee on Legislation for information and for any necessary action."^{*}

SECTION 10—COMMITTEE ON ECONOMICS

"It shall be the duty of the Committee on Economics, excepting where otherwise provided, to deal with (a) Social legislation which includes medical services or benefits presumably for medical services; (b) remuneration and employment of physicians by lay bodies, hospital or official bodies, including *Federal, Provincial and Municipal Governments*."^{*}

^{*} Italics mine.—H.B.A.

It is scarcely credible that the committee responsible for the proposed constitution is serious in expecting the provinces to approve of the flagrant invasion of provincial rights and autonomy indicated by the powers assigned to these as well as to other committees to be appointed by the executive of the Canadian Medical Association, and the medical profession of Canada should awaken to their serious import. If the constitution is approved these committees will be empowered to deal with the Federal and all Provincial legislatures on such important matters as State Medicine and Health Insurance, without reference to the provincial associations, the Colleges of Physicians and Surgeons or other responsible bodies.

Exception also may reasonably be taken to the provisions and wording of Section 5, Chapter X, of the By-laws, especially if membership is made compulsory, with the unpleasant implications regarding the status of members:

"By subscribing to the application for membership under the terms of the by-laws and code of ethics and becoming a member of the association, every member **attorns to these by-laws* and agrees to such right of discipline as aforesaid and thereby specifically waives any right or claim to damage in the event of his being disciplined."

Perhaps all will agree that the sparse population of Canada and the long distances separating the provinces are the chief obstacles in the way of a satisfactory national organization of the profession. These are difficulties such as the British Medical Association does not have to contend with at all, and therefore a form of organization applicable to the latter does not properly apply to conditions in Canada. It is well known that branches of the British Medical Association in Canada never have prospered and that the only bond of union has been through the *British Medical Journal* and an occasional meeting of the British Medical Association in Canada.

In conclusion, I would again emphasize the importance of careful deliberation and a thorough canvassing of the whole question in order to avoid action which may lead to dissension and division rather than to a united national organization approved and supported by all the provinces.

H. B. ANDERSON.

Toronto,

April 11, 1936.

^{*} "*Attorn—Feudal law. To turn or transfer homage from one feudal lord to another; to render homage and service (to a lord). This is the act of feudatories, vassals or tenants . . .*"

(Webster's New International Dictionary.)

Italics mine.—H.B.A.

A Reply to Dr. Anderson

For those who have not followed closely the business affairs of the Canadian Medical Association it will aid in the understanding of Dr. Anderson's letter to supply some background.

About two years ago a committee was instructed by the Council of the Canadian Medical Association to make a revision of the Constitution and By-Laws. On the completion of this task the report was considered by the Executive, and after many amendments was finally approved at the meeting of Council last June. The new Constitution and By-Laws are now in operation. If the new is compared with the old it will be noted that the Provincial associations elect eighteen more representatives this year to the General Council than before; that the personnel of the Executive has been increased from seventeen to twenty; and that representation on this committee from all the Provincial associations has been assured by the By-Laws instead of being left to courtesy as before. In other words the aim has been to give the Provincial Associations a larger voice in the affairs of the Canadian Medical Association, and this quite apart from the idea of any closer union between them.

While the Constitution and By-Laws were being revised a movement began with the Manitoba Medical Association, looking toward a closer relation between the Provincial Associations and the Canadian Medical Association. The idea spread to other Provinces and gathered force. Approval was expressed in many Provinces and Federation became a live issue. To meet the situation an enabling clause was inserted in Article V. of the Constitution giving a Provincial Association the option of federation with the Canadian Medical Association if it so desired. Only two fundamental provisions were made, *viz.*, that all the members of the federating association should be members of the Canadian Medical Association, and that they should be entitled to all the rights and privileges of membership.

It would have been in keeping with the original conception of Federation to look for a union which would include all of the Provincial Associations at one and the same time. However, after considerable study it was realized that this could not be expected, and the "All or None" plan had to be replaced by a plan which would enable a Provincial organization to make its own decision without waiting for the others. Events moved so rapidly that it became necessary to provide special Constitution and By-Laws applicable to Divisions, since at least one Provincial organization was ready to take advantage of the enabling clause in the Constitution. It is this modified Constitution and By-Laws which is referred to by Dr. Anderson in his letter.

It is not the intention in this reply to deal with the desirability or otherwise of any plan of federation, or with the relation of the Ontario Medical Association thereto, or even with the question as to how Provincial organizations should collect their fees, although these matters are all discussed by Dr. Anderson. The purpose of this letter is simply to make some comment on his interpretation of the modified Constitution and By-Laws.

1. Dr. Anderson makes the following reference, although not by name, to the annual meeting of Council (called General Council in the new Constitution and By-Laws):—"The annual meetings of the Canadian Medical Association are really meetings of its executive body with one of the nine provincial associations, at which meetings there is present only a sprinkling of the membership of the eight other provincial associations."

What are the facts? The Council is and has been the governing body of the Canadian Medical Association for years. Its total membership in the past has been approximately 125. This figure is increased by the new Constitution and therefore it may be expected that there will be some increase in attendance. It is not a paper organization. Its sessions extend over a period of two full days and its agenda cover the whole range of the Association's activities, including the Executive Committee's report. The new Constitution should give elected representatives of the Provincial organizations a balance of power at the meetings. But what about the actual attendance at these meetings? The record of the past few years will give some idea of what may be expected in the future. We find that in the last six years the Council has met in widely separated centres. The actual attendance as determined by roll call was as follows:—

<i>Place of Annual Meeting</i>	<i>Date of meeting</i>	<i>Number present</i>
Winnipeg	August 22, 1930	72
Vancouver	June 22, 1931	58
Toronto	June 20, 1932	84
Saint John	June 19, 1933	74
Calgary	June 18, 1934	67
Atlantic City	June 10, 1935	63

As the representation on Council from each Province is limited it is obvious that the members come from far as well as near.

2. Dr. Anderson states that "under the proposed Constitution the Executive committee is in a large measure permanent and self-perpetuating".

What have the By-Laws to say about this? At the annual meeting of the General Council a Nominating committee of fifteen is appointed by ballot, and it must have at least one member from every Province represented at the session.

At a later session of the General Council the Nominating committee presents nominations for representatives from the nine Provincial organizations to the Executive committee. Other nominations may then be received from the floor of General Council, after which elections are carried out by ballot. In this way 13 members are selected. The President, President-Elect, Chairman of General Council, Honorary Treasurer, Editor of the *Journal*, and Secretary are ex-officio members. Provision is made for one more ex-officio member, viz., the Managing Editor of the *Journal*, but at the present time this office is held by the Honorary Treasurer. While this method of election applies in a general way to both Provincial Branches and Divisions, the latter have the privilege of selecting their own representatives to the Executive Committee. It is true that the final step in the election is taken by the General Council, but the rights of the Divisions are so carefully safe-guarded by the By-Laws that their candidates are sure of election.

To summarize the method of electing the Executive committee:— Approximately 70 members (average attendance in last 6 years) of General Council, the majority of whom are selected by nine Provincial organizations, elect 17 of the 20 members of the Executive committee. Can it be fairly said that this committee is "in a large measure permanent and self-perpetuating"?

3. Dr. Anderson states that "In the intervals between meetings a *quorum* (5) of the executive of the Canadian Medical Association functions independently of any general control whatever, and yet assumes to speak and act for the organized medical profession of Canada."

While the future is always somewhat uncertain it is to be hoped that the attendance at the meetings of the Executive Committee will never dwindle down to the official quorum of five. If that time ever comes the Canadian Medical Association will cease to function as a national organization. But perhaps Dr. Anderson is looking backward instead of forward. If so, let us follow him. In the last six years the

Executive Committee has met twelve times *between* annual meetings. On only one occasion was the attendance as low as eleven. The average attendance for these meetings was between thirteen and fourteen. Generally, at least seven out of the nine Provinces were represented. With the progress of the Canadian Medical Association the business to be transacted between annual meetings has increased rapidly, and recently it has been found necessary for the Executive to hold a two-day session. It is scarcely necessary to say that the Executive Committee is responsible to General Council. So much for the *quorum*.

4. Dr. Anderson's practised eye has discovered in Chapter VIII. of the By-Laws two Sections which, on paper at least, appear to give the committees too much power. I am inclined to think he is right, although it would be a rash committee which would interfere in the affairs of a Provincial organization. The intention of the Constitution and By-Laws is perfectly clear. A "By-Law is defined as "a rule or law *subordinate* to a Constitution". Article XIV. of the Constitution refers specifically to provincial autonomy. It enunciates a basic principle to which all By-Laws are subordinate. Dr. Anderson did not quote Article XIV. of the Constitution in full, but here it is:

"No provision of the Constitution or By-Laws herein set forth shall interfere with the status of a Division as a Provincial organization. As a provincial body, it shall have complete control of its own affairs."

5. Dr. Anderson is quite right in insisting that the question of Federation requires careful study on the part of the Provincial associations. It is for these bodies to decide whether they can or cannot accept the plan set forth in the modified Constitution and By-Laws. The Canadian Medical Association did not originate the movement, and has not tried to bring pressure to bear on the Provincial associations in the matter. A new situation has confronted the Canadian Medical Association and it has endeavoured to meet it in an adequate way.

GEO. S. YOUNG

Toronto, May 1, 1936.

CLINICAL OBSERVATIONS WITH INSULIN PROTAMINE COMPOUND.—R. G. Sprague, B. B. Blum, A. E. Osterberg, E. J. Kepler and R. M. Wilder find that the immediate effect of insulin-P (insulin protamine compound) is much less than that of insulin-R (regular insulin). When the former is used alone, and given as a single dose before breakfast, the meals of the first few days provoke glycosuria, but when the dose is properly adjusted the level of the blood sugar on successive mornings decreases progressively and the elevating effect of meals diminishes until, by the end of from four to six days, a normal level of blood sugar may be attained even in cases of severest diabetes. Supplementing insulin-P with small doses of insulin-R will shorten the period of obtaining control. Insulin-R

should not be mixed in the same syringe or injected into the same site with insulin-P. It has not been necessary to continue the supplementary use of insulin-R after the first few days in the milder cases, but probably in many cases such supplementary use of insulin-R will be desirable, especially in emergencies. Until more experience has been obtained it would appear that insulin-R will be the insulin of choice when quick action is desirable, as in the treatment of acidosis. Although insulin-P, in many cases, makes possible effective management of diabetes with only one administration of insulin a day, and with less insistence on rigid control of the diet, its careless use or disregard of the diet is attended with danger.—*J. Am. M. Ass.*, 1936, 106: 1701.

Medical Societies

The Calgary Medical Society

The annual meeting of the Calgary Medical Society was held on April 14, 1936. The following officers were elected for the 1936-1937 session: *President*, Dr. A. J. Fisher; *Vice-president*, Dr. H. N. Jennings; *Secretary*, Dr. A. I. Danks; *Treasurer*, Dr. Morley Cody; *Librarian*, Dr. George Learmonth; *Executive Committee*: Drs. J. A. Reid, A. E. Shore, F. Fish.

Dr. John Fyfe, of the University of Alberta, gave a most interesting address to the members on "The management of severe hyperthyroidism".
G. E. LEARMONTH

The Montreal Physiological Society

At a meeting of this Society, held on March 16th, the following papers were read, (given here in abstract).

S. G. ROSS, H. TAIT MALLOY AND T. R. WAUGH, Department of Physiology, McGill University—Bile Pigment Metabolism and Excretion in *Icterus Neonatorum*.

A study of bile-pigment excretion in the stools and urine of a series of new-born infants was made. The period studied covered the first seven days of life. Secondly, in a series of infants, on the fifth and sixth day of life, the blood was examined for hæmoglobin concentration, corpuscular volume, van den Bergh reaction, and the urine, for bilirubin excretion. The infants were clinically divided into jaundiced and non-jaundiced. The findings are as follows.

In the 14 patients with jaundice, the average daily excretion of urobilin in the stools was distinctly lower than in the 16 non-jaundiced cases. There was comparatively little difference in the excretion of bilirubin in the stools of the two groups. The average combined excretion of urobilin and bilirubin in the stools of the patients with jaundice was definitely lower than in the patients without jaundice. The excretion of urobilin in the urine of the two groups (jaundiced and non-jaundiced) was essentially equal. The excretion of bilirubin in the urine of the jaundiced patients was always present, whereas in the patients without jaundice it was absent in all except four. In the second group, where the blood and urine were studied concurrently on the fifth or sixth day of life (63 cases of whom 22 were jaundiced and 41 not jaundiced), the hæmoglobin concentration and corpuscular volume showed only slight differences in the two groups. In all cases the direct prompt van den Bergh reaction was negative, while the delayed direct was positive in all cases. In the jaundiced cases the indirect reaction averaged 10.1 units, whereas in the non-jaundiced cases it averaged 4.4 units. Bilirubin was present in the urine of all the jaundiced cases

except 4, whereas it was absent in the urine of all the non-jaundiced cases except 3. In these three cases the indirect reaction in the blood showed levels of 10, 13 and 14 units. One feels, therefore, that in these cases the clinical diagnosis was at fault.

The findings show that this type of jaundice is dependent upon the height of the bilirubinæmia in the blood serum, as measured by the indirect van den Bergh reaction. The close agreement in the values of hæmoglobin and corpuscular volume in the two groups is evidence that the jaundice is not due to excessive hæmolysis alone. This, of course, depends upon the assumption that the blood volume and the hæmoglobin concentration at birth of these two groups is the same. The reduced excretion of bile pigments in the stools of the jaundiced patients suggests that the excretion of the excess of bile pigment in the blood is interfered with, either by obstruction in the bile channels or by functional inability of the liver cells to excrete bile pigment. The constant presence of bilirubin in the urine is usually considered as pointing to an obstructive jaundice. On the other hand, the absence of the prompt van den Bergh reaction in the serum of the jaundiced patients definitely rules out a purely obstructive type of jaundice. If so, this lends support to the view that the liver cells are temporarily unable to excrete the great excess of bile pigment, and as a result jaundice develops.

JOHN TAIT AND N. J. BERRILL (by invitation), Department of Physiology, McGill University, Montreal—Synchronism of Heart and Respiratory Beat in *Limulus*.

On *a priori* grounds it was conjectured that the beat of the respiratory appendages of *Limulus* may synchronize with the heart beat. When arrangements are made to observe both simultaneously it transpires that when the respiratory appendages do move they do so in precise *tempo* with the heart beats. As the individual leaves of the gill-books likewise increase in volume with each opening movement of the respiratory appendages this rhythmic volume change is due presumably to rhythmic changes of blood pressure. Because the heart of this arachnid thus constitutes an essential part of its "outer motor mechanism" of respiration, one can better understand (1) the reason for the neurogenic control of the *Limulus* heart, as discovered by Carlson; (2) Plateau's failure to discover externally visible respiratory movements in scorpions and spiders; (3) the curious retention of the "book" form of respiratory organs in terrestrial arachnids.

I. M. RABINOWITCH, Department of Metabolism, Montreal General Hospital—Metabolic Study of the Eskimos in the Eastern Canadian Arctic. These observations were detailed at length in the May issue of the *Journal*, p. 487. (Ed.)

At a meeting of this Society held on April 20th, the following important paper was read (given here in abstract).

HANS SELYE, Department of Biochemistry, McGill University, Montreal—The Alarm Reaction.

Experiments on the rat show that if the organism is seriously injured by acute, non-specific influences, such as exposure to cold (+1 to +7° C.), surgical injuries (handling of intestines), spinal shock (transection of spinal cord), or intoxications with sublethal doses of various drugs (atropine, morphine, vasopressin, etc.), a typical syndrome appears. This develops in two stages. During the first stage, 6 to 24 hours after the initial injury, one observes rapid involution of the thymus and lymph glands, œdema formation with accumulation of transudates in the pleura and peritoneum, decrease of muscular tone, drop of body temperature, formation of acute ulcers in the digestive tract (particularly in the stomach, small intestine and appendix), and sometimes hyperæmia of the skin, loss of reflex irritability, exophthalmos, increased tear secretion, and salivation. During the second stage, beginning 24 to 48 hours after the initial injury, the adrenal cortex enlarges and the chromaffin cells of the medulla, which began to show vacuolization during the first stage, become still more distended with vacuoles. General body growth ceases and the gonads become atrophic. Degranulated basophiles appear in the pituitary, and the thyroid shows a tendency towards hyperplasia. In lactating animals the secretion of milk is discontinued. There seems to be a shift in the hormone production of the pituitary leading to cessation of the production of growth and sex hormones and prolactin in favour of increased elaboration of adrenotropic and thyrotropic principles, which are more urgently needed in such conditions of emergency. We consider this syndrome to be the expression of a general alarm of the organism when suddenly confronted with a critical situation. For the sake of brevity, we shall refer to this syndrome in general as "the alarm reaction" (A.R.), and in particular to its first stage as "A.R.1" and its second stage as "A.R.2". It seemed difficult at first to understand why the organism reacts to such different stimuli in an identical manner. A comparison of the symptoms of the A.R.1 with those of histamine poisoning and surgical or anaphylactic shock make it likely that the liberation of large quantities of histamine or similar substances from tissues is the common factor responsible for the similarity in the symptomatology of the A.R.1, whatever stimulus elicits it. If this supposition be correct, surgical shock would be a special form of the A.R.1 in which substances with histamine-like effect are liber-

ated mechanically from the tissues, differing from other types of the A.R.1 only in that the latter group liberate similar substances by other means—(chemical [drugs]; physical [cold, x-rays, ultra-violet rays]; or nervous stimuli [spinal shock]). This interpretation is substantiated by the following observations. Adrenalectomy markedly sensitizes the rat both to histamine and to stimuli causing the A.R.1. A single dose of 20 mg. of histamine intraperitoneally evokes the picture of the A.R.1 (including gastric and intestinal ulcers), with the exception of the atrophy of lymphoid tissue, in the adrenalectomized rat within 30 minutes to 1 hour, i.e., more rapidly than any other stimulus studied. In the normal rat at least 100 mg. have to be given to obtain similar results. The A.R.1 evoked by drugs or exposure to cold will often cause pulmonary emphysema in the guinea pig (the typical response to histamine in this species) but not in the rat. Hunger, cold, hæmorrhage (all known to sensitize the organism to histamine) also facilitate the production of the A.R.1 by any non-specific damaging stimulus, while Ringer transfusion protects against both histamine and the stimuli causing the A.R. Cannon has shown that surgical shock is greatly dependent on histamine liberated from the protein of crushed tissues. It seems possible that in the case of alarm reactions caused by stimuli other than traumatic injuries histamine liberated from the various organs which lose weight in this condition (particularly the rapidly involuting thymic-lymphatic apparatus) plays an important part. In the light of our findings we should be inclined to interpret the important discovery made by Dodds and Noble that posterior pituitary extracts produce gastric ulcers as an indirect effect, acting *via* the liberation of histamine, possibly in the gastric mucosa itself. While adrenalectomy prevents thymus- and lymph-gland involution following stimuli causing an alarm reaction in the normals it greatly sensitizes the organism to the other symptoms of the A.R.1 (œdema, gastric and intestinal ulcers); at the same time it decreases the resistance of the organism against drugs and injuries. It is possible that the adrenal exerts its protective effect against drugs and injuries and its effect on water metabolism by way of its action on the lymphatic system. After some time drugs lose the power to produce an alarm reaction, in spite of continued daily administration of a dose which evokes the reaction in animals not pre-treated. Our observations lead us to believe that the A.R. may represent a general defense reaction of the organism, comparable in a way with fever, inflammation, the formation of antibodies and the processes occurring during drug habituation.

DONALD J. BOWIE, Department of Histology and Embryology, McGill University—The Distribution of Peptic and Mucous Cells in the Gastric Mucosa.

The difficulty of preserving and staining pepsinogen granules in peptic cells has been overcome by developing new methods of technique (Bowie, *Anat. Rec.*, Feb., 1936). The method is very suitable for the study of human gastric mucosa removed at operation.

In the cat there are only a few peptic cells in the "fundic" glands of mucosa taken from the region near the œsophagus. The maximal number of peptic cells is found in the region near the middle of the greater curvature. Proceeding toward the pyloric portion these cells gradually diminish in number and disappear at the pyloric junction. In this animal the mucous neck cells are present in the deeper parts of the "fundic" glands as well as in the neck region. Near the pyloric junction this type of mucous cell may compose practically the whole of the gland. The staining reaction of the mucus in the neck cells and those deeper in the "fundic" glands is decidedly different from the mucus in the cells of the pyloric glands. After appropriate fixation the peptic cells show a positive reaction to stains for mucus. This may possibly indicate the source of the "dissolved" mucus which Webster and Komarov have found in gastric juice.

The method of staining the pepsinogen granules has been used to show (1) that histamine does not stimulate peptic cells; (2) that adrenalin and splanchnic stimulation likewise has no effect on these cells, and (3) that strong vagal stimulation causes a marked discharge of pepsinogen granules from peptic cells.

J. S. L. BROWNE

The Saint John Medical Society

The Saint John Medical Society was entertained at the Saint John Tuberculosis Hospital last month, when Dr. Norman Bethune, of Montreal, gave an address on "Surgery of the chest". The attendance was large, and many of Dr. Bethune's statements were surprising to a good number of his listeners. The advance in chest surgery has, no doubt, been startling, but according to Dr. Bethune further advances will be shortly forthcoming. Those attending the meeting were afterwards entertained at dinner by Dr. R. J. Collins.

At the regular monthly meeting of the Saint John Medical Society, Dr. R. J. Collins, Medical Superintendent of the Saint John Tuberculosis Hospital, presented an exhaustive statistical report of cases of tuberculosis treated at the Saint John Tuberculosis Hospital over a period of fifteen years. This included all cases which had had surgical treatment of chest conditions. In this group pneumothorax, phrenicotomy and

thoracoplasty were discussed. Dr. Collins compared the results in this series with results obtained elsewhere. This group covered 289 patients in which pneumothorax was attempted, 103 cases of phrenicotomy, and 103 cases of thoracoplasty. It was stressed in the report that all of these cases originating in the Saint John Tuberculosis Hospital had been treated surgically in the same hospital. Discussion of the paper was in the hands of Dr. H. A. Farris, Dr. R. A. H. Mackeen, and others.

Post-Graduate Courses

Children's Memorial Hospital, Montreal

An intensive post-graduate course in pædiatrics is to be offered by the staff of the Children's Memorial Hospital in Montreal for one week beginning Monday, September 14, 1936. An interesting practical and instructive schedule has been arranged for every day of the week, during which there will be lectures and demonstrations in the more important phases of pædiatric work including the special branches of surgery, orthopædics, otolaryngology, etc. Admission to the course will be limited; a nominal fee will be charged. Those interested are requested to communicate with Dr. H. S. Mitchell, Superintendent, Children's Memorial Hospital, Montreal.

University Notes

University of Pennsylvania

The Cancer Research Laboratories of the Graduate School of Medicine of the University of Pennsylvania have been transferred to the Franklin Institute and will be continued under the name of Biochemical Research Foundation. Dr. Ellice McDonald will continue as director, with forty-two research workers on the staff. Thomas S. Gates, president of the University, explained in his annual report that the change was made because Irénée du Pont, who provided funds for the research, could not agree with the University's policy on the question of rewards for scientific research. Last year the University formally adopted the policy that all discoveries should be made available to the public without any profits accruing to the individuals or the institution responsible. Mr. du Pont is said to have expressed the opinion that greater progress would be made if some

definite form of financial reward was held forth. He also felt it would be well for the foundation to patent discoveries with the intent of using profits or income to pay for further research. Mr. du Pont established the cancer research department anonymously in 1927. — *The Diplomat*, 1936, 8: 22.

University of Toronto

Dr. J. G. FitzGerald, Dean of the Faculty of Medicine, Director of the School of Hygiene and of the Connaught Laboratories, University of Toronto, has been invited by the Rockefeller Foundation to make a study of the methods at present employed in the teaching of Preventive Medicine to undergraduates in medical schools. It is anticipated that the study will occupy a period of one year, commencing September 15, 1936. Dr. Charles Edward Smith, of the Stanford University Medical School, San Francisco, will assist in the undertaking. University Medical Schools in the United States and Canada, the British Isles, and in European countries will be visited in the course of the survey.

Dr. FitzGerald is to resign as Dean of the Faculty of Medicine, University of Toronto, June 30th next. He will be given leave of absence by the Governors of the University for the necessary period, and will, it is expected, return to the University of Toronto in September, 1937, as Director of the School of Hygiene and of Connaught Laboratories.

Dr. E. Stanley Ryerson, Assistant Dean and Secretary of the Faculty of Medicine, University of Toronto, recently spent two weeks in the western provinces, visiting the Universities of Alberta, Saskatchewan and Manitoba. He accompanied Dr. W. D. Cutter, Secretary of the American Medical Association, in the Survey of Medical Colleges of the United States and Canada that has been proceeding for the last two years under the auspices of the American Medical Association and the Association of American Medical Colleges.

Dr. Ryerson was entertained by the graduates in medicine at Edmonton and Winnipeg, whom he found very loyal to their Alma Mater and greatly interested in the various developments that have occurred in the training of the students since their time, as well as in the whereabouts of many of their old professors. Dr. Ryerson also addressed the Canadian Club at Edmonton on "The doctor past, present and future." Dr. Ryerson was much impressed by the cordial reception and full cooperation given to Dr. Cutter and himself by the administrative officers and heads of departments of the three institutions visited.

Special Correspondence

The London Letter

(From our own correspondent)

During the last few years this nation has become increasingly keen on the cultivation of better physical development, and various aspects of this problem have been mentioned from time to time in these letters, not the least important of which being the danger of "getting the body on the brain". The British Medical Association set up a special committee last year, largely as the result of a hint from the Minister of Health, "to consider and report upon the necessity for the cultivation of the physical development of the civil population and the methods to be pursued for this object". The report is now available and is a very valuable document. Beginning with a discussion of the importance of exercise, fresh air, sunshine, diet and clothing, the report goes on to survey the place of physical education in the schools. This reveals that neither equipment nor instruction is at all satisfactory, and one of the first recommendations is to provide properly equipped gymnasias, together with changing-rooms and shower baths. The committee deprecates the way in which organized games are far too often regarded, especially by boys, as much more important than proper physical attendance at a gymnasium. Swimming receives due attention, and the doctor is urged to play a much more intimate part in supervising the physical educative side of school life. Whether voluntary organizations could cope with the physical training of boys and girls after leaving school depends upon what can be organized in the future. Clearly, there must be some great extension of existing facilities, and an interesting suggestion also included in the report is to the effect that instruction in elementary physiology and hygiene should be regarded as an essential part of the program of physical education.

While the medical profession is debarred by ethical standards from any form of advertising, there is no restriction whatever in this country for the advertisements of remedies for any form of disease, with the one exception of venereal disease. It is clear to any thinking person that to offer a positive cure for cancer, diabetes, and certain other disorders may well lead to an unfortunate delay before the patient seeks and secures proper medical advice, and it is particularly important that some disorders come under treatment as early as possible. Ever since the Select Committee of the House of Commons published its report on the Patent Medicines in 1914, there has been available incontrovertible evidence of the widespread evils extending in this country. There are many vested interests, however, including all those who make money out of advertisements, and it has been very difficult to

see how best the matter can be tackled. There was presented to the House of Commons last month, however, a Bill which had the backing of newspapers, advertising agents, pharmaceutical authorities, and the medical profession, which, with this large measure of agreement, did appear to get over all the difficulties. However, there was another attraction in the shape of the Grand National, and out of six hundred or more members of Parliament less than forty were available to debate the measure which had taken years of patient labour. As a result the Bill had to be dropped, and no progress is possible at the moment unless the Minister of Health will take the matter up. It is now over twenty years since the Select Committee produced its report, and although it is well recognized that legislation takes time it would appear that the so-called latent period might well be brought to an end. Meanwhile the average young doctor prescribes more and more proprietary preparations, so that he too may well become an opponent of any legislation to regularize this sort of business. After all, if pharmaceutical education is to be carried on by circulars received through the post, any ban on advertising might interfere with this method of acquiring knowledge. Perhaps before the public can be persuaded that quack advertising is bad, the medical profession might adopt a self-denying ordinance in this respect.

Better fortune is anticipated for the new Midwives Bill which the Minister of Health has presented to Parliament for discussion at an early date. It will be remembered that one of the schemes for improving the maternity services of the nation was to organize a proper supply of salaried midwives under the health authorities in every district. The general principle behind the Bill secures that every maternity patient shall be nursed by a qualified midwife with prohibition of unqualified persons attending maternity cases for gain and the establishment by local authorities of a definite salaried service, so that midwives no longer have to eke out in many instances a precarious existence. Each authority has to fix a scale of fees for the services of midwives, and such fees may definitely be recovered according to the circumstances of the family. A very excellent proposal in the Bill is the suggestion that midwives may have to attend post-graduate courses, and the view is expressed, unofficially, that these must certainly include better instruction in the care of the newborn infant. While it is perfectly true that the maternal mortality rate has caused great alarm, it is not always realized that the neo-natal death rate is far too high in view of the great advance made in bringing down the total infant mortality rate during the last thirty years. It is possible that the total course of training for midwives will be much increased in length, and when that happens the

pædiatrician hopes to get a more definite share of the period allocated to him for special instruction.

ALAN MONCRIEFF.

121 Harley St.,
London, W.1.

The Edinburgh Letter

(From our own correspondent)

In the current issue of *The Student*, the undergraduate magazine of Edinburgh University, there appears an article by Dr. Chalmers Watson, a former teacher of clinical medicine, on the subject of the proposed reform of the medical curriculum. The case for reform he says is overwhelmingly strong and urgent. When the defects of the present curriculum were first discussed at a meeting of the Edinburgh Medico-Sociological Club some years ago there was found to be virtually complete agreement among all those who took part in the discussion—professors, extra-mural teachers, and others interested—as to the need for drastic reforms. When, however, the subject was more intimately approached, it was revealed that the field open to reform became more and more restricted. Recurring speakers, while freely recognizing the existence of grave defects or excesses in the teaching of other subjects, were definitely inclined to regard their own subject as an outstanding exception. The primary objective in a medical curriculum—an efficient medical education adapted to meet the needs of the general practitioner of the future—was, to a great extent, quite lost sight of. The real explanation of the anomaly, says Dr. Watson, lies in the undue prevalence of an excess of caution based on a great fear of the results which would follow such changes as were considered necessary. He points out, however, that the case for reform has been greatly strengthened by three authoritative pronouncements. These are lengthy reports issued by leading representatives of the medical section of the League of Nations which reveal a note of comparative hopelessness of getting the medical authorities in power to take appropriate action; the British Medical Association's interim report, with recommendations which have made a wide appeal to the profession, which is now before the General Medical Council; and the joint report of the Royal College of Physicians and of Surgeons in England, and the Universities of Oxford and Cambridge, whose findings were, in general, in substantial agreement with those of the British Medical Association. The essential feature in the recommendation of the Association is that the present curriculum has become needlessly and unwisely specialized, and fails to meet the needs of the general practitioner of the future.

pharmacology are as applicable to the treatment of the teeth and jaw bones as to the remaining parts.

I should advise him to complete the first two years of the medical course before beginning the study of dentistry.

I should attempt to save him from the embarrassment of reading on the top of his final examination in anatomy, "Dental students answer the first eight questions, medical students answer ten".

I should advise him to secure his A.B., B.M., or M.D., but should not insist on this, as degrees do not necessarily denote erudition or culture.

I should warn him about the evaluation of his credits for advanced work or degrees in the future.

I should emphasize that correct diagnosis is the supreme achievement in health service.

I should remind him that surgical judgment is greater than technique.

I should expect him to have greater knowledge of preventive dentistry than a member of any other professional group.

I should expect him to be able to discuss all phases of bone phenomena with the orthopaedic surgeon and possibly lead the discussion.

I should point out that he should approach his research problems from the standpoint of pure science.

I should like him to feel, in so far as his personal preparation is concerned, that he is able to take his equal place with those earnest workers engaged in the advancement of science. —Hugh W. MacMillan. Excerpts from address at the Eleventh Annual Fall Clinic of the Montreal Dental Club, *J. Canad. Dent. Ass.*, December, 1935.

Abstracts from Current Literature

Medicine

Latent Adolescent Pulmonary Tuberculosis.

Wingfield, R. C. and Macpherson, A. M. C., *Brit. M. J.*, 1936, 1: 741.

A large proportion of tuberculosis in young adults is first diagnosed when the lesions are far advanced and when the results of the most expensive and prolonged treatment are seldom really satisfactory, since the danger of relapse is always great. The late diagnoses are undoubtedly due to the fact that pulmonary tuberculosis is during long periods of its activity a symptomless disease. The authors believe, from their experience of recently diagnosed adult cases, that the extensive lesions present were in many cases deposited during adolescence, with the accompaniment of slight, or unexplained, constitutional disturbance. The lesions remained unrecognized until they had spread extensively or were reactivated by some environ-

mental factor. To test this theory, some 2,381 adolescents of both sexes, from 14 to 21, all actively working or at school, and considered healthy, had their chests x-rayed. The plates were then examined to pick up x-ray shadows which could be interpreted as indicating "pathological changes in the lung parenchyma, having the appearance which was compatible with, and usually associated with, tuberculous lesions of the adult type." Fifteen of the 2,381 plates were undoubtedly "positive", and of 18 additional abnormal films, 10 were "probably tuberculous", i.e., an undoubted incidence of 0.65 per cent and a probable incidence of 1.08 per cent of latent pulmonary tuberculosis of the adult type. The actual incidence of clinical pulmonary tuberculosis in young adults from 21 to 35, is variously estimated as being about 0.75 per cent for males and 0.5 per cent for females. The x-ray positive adolescents were all working long hours at either school or work, and were subject to all the usual physiological stresses of adolescence. It is reasonable to assume then that a very definite proportion of the clinical tuberculosis of young adults will develop from this adolescent group of lesion-carriers.

The authors plead for the adoption of such methods as will detect these adolescent lesion-carriers while still in the latent stage. At this time it is comparatively easy to handle them so that they will never develop clinical disease; hence adult mortality will be reduced by whatever proportion (probably a large one) these adolescent lesion-carriers contribute to the adult clinical cases. Under present methods the young adult death-rate from tuberculosis is not declining. If this death rate could be made to decrease materially by the institution of even such expensive investigative methods as the above they would be well justified.

W. FORD CONNELL

Peptic Ulcer. A Study of the Disease before and after the Demonstrated Ulcer. Schnitker, M. A. and Evans, W. A., *New Eng. J. M.*, 1936, 214: 198.

The actual ulceration is not the most important or significant manifestation of the disease. As cavitation is but one lesion in the course of pulmonary tuberculosis, so ulceration is but a part of the picture in this disease. Among 1,653 patients seen in the out-patient department of Peter Bent Brigham Hospital in whom peptic ulcer was suspected clinically there were 31 in whom one or more roentgenological examinations revealed no ulcer or ulcer deformity of the stomach or duodenum and in whom at a later date an ulcer was demonstrable. These cases are the basis of this study.

They fall into four groups. The first group of 16 patients consists of those in whom the first roentgenological studies were entirely negative so far as the stomach and duodenum

were concerned, and in whom a duodenal ulcer was demonstrated subsequently. The second group contains 2 patients in whom a gastric ulcer appeared. In the third group are 20 patients in whose case the evidence is in part surgical. In one, two exploratory laparotomies by experienced surgeons gave no evidence of ulcer, although the stomach and duodenum were carefully examined on both occasions; a duodenal ulcer was finally demonstrated roentgenologically four years after the last laparotomy. In the other case, four roentgen examinations over a period of five years failed to reveal a crater or the deformity of one, while the presence of a duodenal ulcer was later established by laparotomy.

The final group of 11 patients consists of those in whom the first barium studies were regarded as doubtful because of transient deformity or irritability of the duodenal cap. In these patients no crater or constant deformity could be made out in the initial examinations, although a typical duodenal ulcer was demonstrable at a later date. The evidence would indicate that the lesion present at the time of the early examination was a duodenitis.

The cases were studied to compare the findings before and after the demonstration of the ulcer. There were no appreciable changes in symptomatology with the presence of the ulcer. There appeared to be a high incidence of night pain, 17 of the 31 patients had this. Six of the patients had bleeding when no ulcer was demonstrable. Nine had gastric analyses before the ulcer appeared; in 4 of these the free acidity was high and in 1 no free acid was present after the test meal. The gastric analysis in these cases after the ulcer was present showed no appreciable difference in 7 of the cases; in one case there was more acid and in the other there was less.

A diagnosis of ulcer cannot be made from the presence of thickened rugæ alone. The average trend in about half the cases was slight but definite increase in the thickness of the rugæ up to the time of the demonstration of the ulcer. In two cases the rugæ were definitely less tortuous and thickened at the time of the ulcer than on previous films.

LILLIAN A. CHASE

Gastrosopic Observations in Neoplasm. Benedict, E. B., *New Eng. J. M.*, 1936, 214: 563.

Since the invention in 1932 of the Wolf-Schindler flexible gastroscope the practice of gastroscopy has increased rapidly. The flexible gastroscope was first used on this continent in 1933 at the Massachusetts General Hospital, and is now used in a number of the larger clinics.

Fourteen cases are described in detail as to x-ray findings and gastroscopy. It is found that gastroscopy is a very helpful supplement

to x-ray examination in diseases of the stomach. It is not offered as a substitute for the x-ray, since it is admitted that the latter is indispensable in the diagnosis of gastric conditions. Since œsophageal disease may be a contra-indication to gastroscopy, x-ray study of the œsophagus and cardiac orifice should always be carried out as a preliminary procedure. Patients with stomach complaints, even if vague and of short duration, should have early x-ray examination, followed in selected cases by gastroscopy, which is a valuable adjunct to x-ray in (1) making an early diagnosis of carcinoma; (2) in differentiating benign and malignant lesions; (3) in determining the location and extent of the lesion and (4) in excluding intragastric lesions.

LILLIAN A. CHASE

Uncomplicated Auricular Fibrillation and Auricular Flutter. Orgain, E. S., Wolff, L. and White, P. D., *Arch. Int. M.*, 1936, 57: 493.

The authors are dealing with cases suffering from these two conditions, who have no other signs of heart disease, showing that they are not infrequent, and that their prognosis is usually good. These clinical entities are not seldom caused by extra cardiac factors, such as the toxic group, which includes infections, drugs, and chemical agents such as alcohol and tobacco, and the traumatic group, injuries, shock, nervous disturbances, reflex occurrences associated with abdominal conditions, cough, vomiting and some other agencies.

Forty-nine cases of auricular fibrillation and seven of auricular flutter are reported which showed no other evidence of heart trouble. Many of these patients have been observed over long periods of years and have been alive as long as 33 years after onset, many as long as 16-17 years when divided into groups according to whether the onset was before and after 40 years of age. There was not nearly as much difference in the subsequent history as one would expect. Only one of the 54 cases reported was due to hyperthyroidism. Quinidine was used in a great many cases, sometimes in very large doses, and was usually very successful in making the irregularity disappear.

It would seem that such cases can be described as functional.

P. M. MACDONNELL

Recurrence of Inoculation Malaria. Peterson, M. C., *J. Am. M. Ass.*, 1936, 106: 775.

By the majority of practitioners the recurrence of inoculation malaria is entirely disregarded. Such an attitude, though excusable, is not justifiable. The present author reports on a series of 261 cases treated with inoculation malaria (tertian). In 14 cases the parasite was found in thin blood films from 6 to 150 weeks after subsidence of the fever. These

patients had received from 5.3 to 97 gms. of quinine sulphate by mouth. In 11 cases there was definite recurrence of the fever. The writer concludes that inoculation malaria differs in no respect from that transmitted by the mosquito. He forcibly suggests that repeated blood searches in malaria-treated cases having fever from any cause would reveal a number of unsuspected recurrences. It may even be said that inoculation malaria may be a factor in the spread of the disease.

G. N. PATERSON-SMYTH

Surgery

The Nicola Operation for Recurrent Dislocation of the Shoulder. Willard, D. P., *Ann. Surg.*, 1936, 103: 438.

The author lists the various methods used for the repair of recurrent shoulder dislocation. Nicola's method impressed him because of its technical simplicity and the resulting functional efficiency. A step tenotomy of the long head of the biceps is done. A hole is drilled in the bicipital groove at the level of the lower border of the transverse humeral ligament through the humeral head, to emerge anteriorly to and above the centre of this structure. The upper part of the divided tendon is passed through this tunnel and sewn to the distal portion. A Velpeau bandage is worn for five days and then replaced by a sling. Passive extension and flexion of the shoulder and elbow are started at the end of the second week. More active movements are started at the end of three weeks. Elevation of the arm beyond the shoulder level is avoided for eight weeks. The end-results of 10 cases treated in this manner are reported. One patient had one recurrence of dislocation due to a major trauma. All returned to their former occupations.

STUART GORDON

Penetrating Wounds of the Brain. Pileher, C., *Ann. Surg.*, 1936, 103: 173.

The literature dealing with missiles in the brain is enormous, but is composed largely of reports on isolated unique cases and of very few accounts of any research investigation of the problem. Experience of the war crystallized a few of the principles of treatment, but there remain a number of debatable points. Pileher has studied the effects in dogs of wounds of the brain caused by protruding foreign bodies (unsterile nail) and by deeply embedded foreign bodies (unsterile shot placed in brain by sterile operation). He found that if foreign bodies penetrate the ventricle and are allowed to remain protruding through the skin a fulminating, fatal infection of meninges, brain and ependyma invariably results. Removal of the protruding foreign body within 12 hours after its insertion greatly reduces the

incidence of fatal infection. If the ventricle is not penetrated by the protruding foreign body the incidence of fatal infection is considerably reduced. Closure of the scalp over an inserted foreign body reduces the incidence of fatal infection and prolongs the survival time if infection develops. Deeply embedded foreign bodies which do not communicate with the skin or subarachnoid space do not cause fatal infection unless the ventricle has been traversed. In the presence of established superficial cerebral infection about protruding foreign bodies early adequate drainage reduces the mortality rate. Pileher concludes with a few therapeutic suggestions:—

1. Foreign bodies in the brain which are in communication with the skin, the subarachnoid space, or the ventricular system should be removed at the earliest possible moment.

2. Deeply-embedded foreign bodies not falling in the category just mentioned should be removed only if local irritation or destructive symptoms are present.

3. If infection already exists about a superficially placed or protruding foreign body, removal should be accompanied by the establishment of adequate open drainage.

FRANK TURNBULL

Tumours of the Carotid Body. Peterson, E. W. and Meeker, L. H., *Ann. Surg.*, 1936, 103: 554.

Tumours of the carotid body are rare. The authors discuss 18 cases; 11 were females, 7 males. The average age was 38. A tumour had been present prior to operation from 4 months to 30 years (average 6 years). A correct pre-operative diagnosis was made twice. Eight tumours proved to be malignant. The common carotid artery was tied in seven cases. Four did not develop any evidence of brain damage.

There are no pathognomonic signs or symptoms of carotid body tumour. The usual story is of a single, smooth, deep-seated, slowly-growing, painless, ovoid, firm tumour at the bifurcation of the carotid. It is not attached to the skin or muscles. It is movable laterally but not vertically. In size it varies from that of a hazel nut to a goose egg. A transmitted pulsation is present. It is rarely bilateral. Symptoms due to pressure on the vagus or the cervical sympathetic may be present.

Early and complete removal, if it can be accomplished without the sacrifice of important arteries, is the ideal treatment. The majority of cases that have been treated by roentgen ray and radium have resulted in failure. Thus excision, even if at the expense of arteries, appears to be the only rational treatment. The authors believe that the mortality and morbidity can be lowered (1) by the making of an accurate diagnosis, i.e., by biopsy and proper examination, (2) by attempting before operation

to develop a collateral circulation on the affected side by regular compression of the common carotid, and (3) by ensuring that the first operation be exploratory. If the growth cannot be excised without removal of the carotid then a temporary ligation should be done, to be removed at the first sign of hemiplegia. If no symptoms of brain damage appear, then a secondary operation can be done for removal of the neoplasm.

STUART GORDON

Obstetrics and Gynaecology

Puerperal Infection Due to Anaerobic Streptococci. Schwartz, O. H. and Brown, T. K., *Am. J. Obst. & Gyn.*, 1936, 31: 379.

In a review of 13,237 deliveries occurring in Barnes Hospital and St. Louis Maternity Hospital from July 1, 1924, to July 1, 1934 these authors confirmed the work of Seibottmüller, reported in 1910, that puerperal infection is frequently due to anaerobic streptococci. In 228 cases of puerperal infection Schwartz and Brown found anaerobic organisms present in 83.3 per cent of cases of endometritis, 59 per cent of cases of thrombophlebitis, and 42.5 per cent of cases of septicaemia. In 31 fatal cases anaerobic streptococci were the infecting organisms, in 15 patients of whom 4 were uninfected before admission.

The presence of anaerobic streptococci in the vagina of a large percentage of women at term indicates that the infection is endogenous and develops only when conditions favour their growth. Such conditions are prolonged labour where the tissues have been bruised to some extent, rupture of the membranes for some time before labour, and difficult operative deliveries. Infection with this type of organism may be largely prevented by instillations into the vagina during labour. Since January, 1930, the authors have used 1 per cent neutral acriflavine in glycerin.

ROSS MITCHELL

The Reduction of Mortality in Ectopic Gestation. Gordon, C. A., *Am. J. Obst. & Gyn.*, 1936, 31: 280.

The impression that the mortality of ectopic gestation is well under control is erroneous. Nearly 6 per cent of the maternal mortality of the City of New York is due to ectopic gestation; equally high figures, with a large percentage of deaths due to sepsis, and many patients never operated upon at all, are reported elsewhere. Even gynaecologists have published inconsistent results. The outstanding fact is failure of diagnosis.

Our textbooks disagree on treatment and for the most part fail to emphasize and discuss

thoroughly the importance and value of supportive treatment. It should be possible to rationalize teaching, at least. It should not be said repeatedly that diagnosis is especially difficult, nor should it be unqualifiedly stated that every patient should be operated upon at once, no matter what her condition, no matter who may be the operator.

In the presence of intraperitoneal blood only the simplest operative procedure should be carried out. It is perfectly proper and wise to defer operation in many serious cases, not indefinitely but until transfusion and other supportive treatment lessen the risk of operation.

ROSS MITCHELL

Physiology and Biochemistry

A Study of the Serum Phosphatase in Bone Disease. Woodward, H. Q., Trembly, G. H. and Coley, B. L., *J. of Clin. Investigation*, 1936, 15: 193.

Since the development of satisfactory methods of determining the phospholytic activity of the blood by Kay, Bodansky, and others there has developed an increasing interest in the relation of blood phosphatase to various pathological conditions. It is now fairly well established that the major portion of the phosphatase in the blood is contained in the erythrocytes; of the phosphatase in the serum a part may well originate in the bones and a part in the liver, kidney, and intestinal mucosa, these structures being rich in phosphatase.

The serum phosphatase of non-osseous origin is raised by the ingestion of carbohydrates, greatly raised by obstructive jaundice, and lowered by starvation and the ingestion of proteins; the serum phosphatase of osseous origin is greatly increased in bone diseases associated with excessive osseous and osteoid formation.

The authors determined the serum phosphatase by a modification of Bodansky's method on normal persons and on cases of neoplastic disease of bone. The phosphatase of normal serum did not appear to differ from that of pathological serum in degree of activation, as measured by the activating effect of magnesium, or in pH of optimum activity. The serum phosphatase was found to be normal or very slightly raised in chronic osteitis, osteomyelitis, benign tumours of bone, endothelial myeloma, and chondrosarcoma, and high in osteitis deformans, generalized osteitis fibrosa cystica, osteoplastic metastatic disease, and in some cases of osteogenic sarcoma, particularly those in which there was radiographic evidence of considerable bone production. Serum phosphatase determinations were not found to be of value in detecting pulmonary metastases.

JOHN NICHOLLS

Pathology and Experimental Medicine

The Presence of the Intrinsic Factor of Castle in the Gastric Juice of Patients with Pernicious Anæmia. Goldhamer, S. M., *Am. J. M. Sc.*, 1936, 191: 405.

Goldhamer obtained gastric juice from patients suffering from pernicious anæmia during a relapse, incubated it with beef steak after the method of Castle, and fed it to other patients suffering from the same condition. Reticulocyte responses were obtained, the degree being proportionate to the quantity of juice and beef fed to the patient. These results are counter to those of Castle and his co-workers, who obtained no reticulocyte response after the feeding of gastric juice obtained from patients suffering from the disease. Goldhamer concludes that the intrinsic factor of Castle is not absent from the gastric juice in pernicious anæmia but merely deficient in quantity. Thus in relapse the red cells fall to a level determined by the amount of intrinsic factor which the patient is able to secrete in his gastric juice. This hypothesis explains why patients in relapse have variable red cell counts and why those patients with pernicious anæmia who apparently have no intrinsic factor in their gastric juice are able to produce a variety of mature erythrocytes. Neither this nor the hypothesis of Castle explains why characteristic spontaneous remissions occur in the disease.

E. S. MILLS

Present Views of Calcium—Phosphorus Metabolism. Wagoner, G., *Am. J. M. Sc.*, 1936, 191: 511.

Wagoner draws attention to certain factors which determine the absorption of calcium from the intestinal tract. The normal daily intake of calcium is approximately one gram, and of phosphorus two grams. Under certain conditions, however, much larger quantities of these substances present in the daily diet may fail to be absorbed from the intestinal tract and thus be lost to the individual. He points out that soluble salts of calcium may be thrown out of solution by the presence within the small intestine of excessive amounts of carbonates. An excess of phosphates may have a similar action. In fact a marked alkaline reaction of the contents of the small intestine from whatever cause may precipitate soluble calcium salts. Likewise the presence of large amounts of free fatty acids will render calcium salts insoluble and interfere with saponification. Thus with a diet excessive in fat or through deficient digestion of normal fat (as in celiac disease) failure of calcium absorption may result. On the other hand the assimilation of calcium and phosphorus is augmented by an adequate supply of vitamin D, by an acid reaction of the intestinal contents, or

by a systemic acidosis such as may be produced by the administration of ammonium chloride.

Calcium and phosphorus assimilated from the small intestine enter the plasma of the blood and are there maintained in the following proportions; calcium in loose colloidal combination with serum protein 4 mg. per cent; calcium combined with phosphorus in the form of a salt 4 to 5 mg. per cent; and ionized calcium 1 to 2 mg. per cent in organic phosphorus in a concentration of 4 mg. per cent. The first mentioned compound is physiologically inactive and not in equilibrium with phosphorus. The manner in which calcium and phosphorus are removed from the blood stream and deposited in the bones in the proportion of 3 molecules of tricalcium phosphate to 1 molecule of calcium carbonate is not definitely understood. There are two theories; the one that the transformation is by means of specific cells—osteoblasts; the other that permeation and precipitation is of a purely chemical nature. It is generally conceded however that the enzyme phosphatase and vitamin D play an important rôle in this deposition. The reverse process, the transfer of bone calcium and phosphorus into the blood when that tissue is deprived of these inorganic elements, takes place even more readily than by assimilation from the diet, thus explaining the decalcification of skeletal bones in certain deficiency diseases.

In addition to the utilization of calcium and phosphorus in bone development, calcium is essential to the clotting of blood, the contractibility of involuntary muscle, and for the maintenance of a normal degree of neuromuscular irritability. It also plays a dominant rôle in maintaining the selective permeability of the living cell. Phosphorus is essential to lipid metabolism, to the energizing of muscular contraction, and to the functioning of nervous tissue.

E. S. MILLS

Renal Rickets and Dwarfism: A Pituitary Disease. Chown, B., *Brit. J. Surg.*, 1936, 23: 552.

The cases reported are two sisters who had from birth signs of severe rickets and peculiar emotional upsets. Both had a hypercalcaemia with normal or slightly reduced phosphatæmia without any discernible decalcification of the skeleton. Both had early changes in the kidneys, which would have led to chronic nephritis. One died at 3, the other at 6 months. The parents of the children were first cousins of English-Welsh extraction. The husband had been married before, and the only child of that marriage was a normal son who had a normal child. By his second marriage to his cousin, he had nine children. The first progeny was an ectopic one. The second, third and fourth pregnancies were miscarriages; the fifth and

sixth were stillborn; the seventh was a normal girl; the eighth and ninth are the subjects of the report. The blood Wassermann of the mother was repeatedly negative, as were all the results of medical examination with the exception of a - 12 basal metabolic rate.

The data with respect to the two deformed infants are as follows: Only two minute parathyroids in each infant; normal hypophysis in the one child in whom it was examined in a few sections; but in the second child in whom serial sections of the hypophysis were made there was no pars intermedia or pars posterior. The first child failed to gain weight; the second on whom measurements were made was average in size at birth but became a dwarf before death at six months. This was accomplished by failure of bony growth, although cartilage and osteoid tissue grew. The skull actually grew more slowly than the brain, with resulting increase of intracranial pressure, and final respiratory paralysis. The kidneys were larger than normal, were firm and hard, with deposits of calcium salts in the tissues. Both had excreted calcium casts before death. The disease is interpreted as due to the faulty hypophysis rather than to faulty kidneys. The symptoms of dwarfing, polyuria, and infantilism can be attributed to the former, and the diseased kidneys are looked upon as resulting from disturbed bone growth which in turn causes a disturbed mineral metabolism which damages the kidneys by causing them to excrete too much calcium.

The hereditary nature of this syndrome is indicated by its occurrence in several children of related parents. MADGE THURLOW MACKLIN

Therapeutics

Treatment of Chronic Non-Specific Arthritis with Intramuscular Injections of Sulphur.

Kreslin, D., *Brit. M. J.*, 1935, 2: 1144.

The author gives his results in the treatment of 50 cases of chronic non-specific polyarthritis with intramuscular injections of a 1 per cent sulphur suspension in oil. The cases tested were selected on account of their lack of response to most of the usual out-patient methods of treatment, such as removal of septic foci, vaccines, physiotherapy, and various drugs (not including gold-salts). The sulphur is injected intramuscularly into the thigh or buttock, starting with 0.5 c.c., increasing amounts being given at 5 to 6 day intervals. Local reactions are generally not severe, but in 10 to 24 hours there is a general rise of temperature—a rise to 103° being considered desirable in young and robust patients, 100° being sufficient in older persons. With the temperature there are malaise, headache and aching pains. The dose should not be large enough to induce nausea. When the ultimate results were good the treatment induced at this time an increase

of pain, stiffness and swelling of the affected joints. There was invariably a marked polymorphonuclear leucocytosis. A few illustrative case reports are given, and the results summarized.

It is pointed out that this treatment is contraindicated in the acute febrile stage of arthritis, and in elderly, feeble or emaciated persons. The author does not advise its use in nervous patients, those having other active organic disease, as tuberculosis, or in the very obese.

The mode of action is discussed, and a possible specific influence of the sulphur suggested, although undoubtedly the large part of the really striking benefit noted in many cases was due to the non-specific febrile reactions.

It would seem that best results may be expected in patients in whom the changes are limited to the soft tissues about the joint and are not permanent in nature. Less improvement was noted when bone and cartilage involvement was marked, with partial dislocations and gross deformities. A certain tendency to relapse was noted, when etiological factors were still active. W. FORD CONNELL

Prevention of Severe Reactions in the Gold Treatment of Rheumatoid Arthritis. Williams, H. J., *Brit. M. J.*, 1935, 2: 1098.

In common with other clinicians the author has experienced some troublesome skin reactions during the treatment of rheumatoid arthritis cases with intravenous injections of gold salts. Following the technique of C. Mayer, of the Laennec Hospital in Paris, he has adopted the use of a 10 per cent solution of calcium gluconate, given in conjunction with the gold salt, intravenously. Mayer used "Crisalbine", starting with 0.1 gram, giving a week later 0.15 grams, and thereafter at weekly intervals 0.25 grams, for a 16 weeks' course. The author has used "Allochrysine", and has found it safe to commence with 0.1 gram of this preparation and carry on with weekly doses for a total course of 1.8 to 2.4 grams, with no serious effects in 16 cases, although previously the same salt without calcium gluconate gave troublesome reactions in over one-third of the cases in which it was used. He notes that several cases of the 16 developed a few itchy papules on the hands, or, commonly, on the feet; that these have been disregarded and the treatment continued without ill effect. Also, several cases showed a mild stomatitis towards the end of their treatment, which was in no case troublesome.

The author feared that perhaps the addition of calcium gluconate to the gold would neutralize not only its toxic but also its therapeutic effects. This fear does not seem to have been justified, since not only does the clinical condition of the patient appear to improve as rapidly as with unadulterated gold, but there is also the return of the sedimentation test to normal, which serves

as about the best indication we possess that the disease process is becoming quiescent.

W. FORD CONNELL

Treatment of *B. Coli* Pyelitis with Alkalis.

Osman, A. A., *Brit. M. J.*, 1936, 1: 575.

The author believes that alkali therapy, if properly used, provides a simple, cheap and effective remedy for all uncomplicated cases of *B. coli* pyelitis. Essential factors in the method are the production of a copious diuresis and a sufficiently alkaline urine. Rest is essential in all acute, pyrexial cases, as long as there are any symptoms or temperature elevation. The sedimentation rate is a useful guide to progress. At least six pints of fluids should be taken daily. The dosage of alkalis should be such as to produce a pH of 7.6 in an early morning specimen of urine. The reaction is best determined by testing with brom-thymol blue. The author recommends that 30 grains each of sodium bicarbonate and potassium citrate be given per dose, flavoured with syrup of orange or peppermint water. This amount is given every one, two, three or four hours depending on the urgency of the case, and continued until the desired result is obtained. This should usually be achieved in 48 hours or so. Then, the spacing of the doses is increased, so that the desired alkalinity of the urine is just maintained (say, 4 doses daily).

If the dose of alkali has been sufficient all the symptoms are usually relieved in two days, and if they persist for much longer than this, the details of treatment having been carefully observed, it usually means complications, as renal or ureteric calculi. Therefore, after 7 to 10 days, if the results are unsatisfactory, the author recommends cystoscopy and pyelography. Successfully treated cases should continue with a moderate dose of alkalis for some months, until several spaced bacteriological examinations have shown the urinary tract to be sterile. Alkalosis is only a danger with the alkali treatment, when there has been persistent and prolonged vomiting or persistent over-breathing from any cause.

The author, in conclusion, notes that the alternative method of treating pyelitis by ketogenic diets or mandelic acid has proved highly successful in a high proportion of cases. A criticism is that the treatment cannot be maintained for a sufficiently long period to prevent relapses which are frequent when these methods are used.

W. FORD CONNELL

The After-history of Lipoid Nephrosis. Major, R. H., *Am. J. M. Sc.*, 1936, 191: 43.

Major has studied six cases presenting the syndrome of lipoid nephrosis. Two of the patients died, one within two months and the other three years after the onset of the disease. Both showed acute glomerular nephritis with evidence of chronic glomerular changes. Of

the remaining 4 patients, one appears to be in good health but shows albuminuria, and 3 are clinically well 8 years, 4½ and 4 years after the onset of the disease. These three patients were treated at one time or another by practically every recommended type of therapy, including high protein diets, blood transfusions, intravenous glucose, thyroid extract, parathormone and various mercurial diuretics such as novazurool and salyrgan. On the high protein diets the patients simply excreted the excess protein as urinary nitrogen. Blood transfusions and intravenous glucose injections were of temporary value only. Thyroid extract and parathormone were valueless, and bacterial antigens were of questionable value. The mercurial diuretics at times produced diuresis, but on other occasions did not. No detrimental effects resulted from their use. One patient died of acute nephritis a few days after receiving gum acacia intravenously. The three patients clinically well appeared to owe their recovery to the use of a very high carbohydrate diet, from 600 to 1,000 grams daily, though the author admits the possibility that the improvement may have been due to the healing powers of nature.

E. S. MILLS

Causes of Death in Diphtheria and their Prevention. Hayne, A. L., *Am. J. M. Sc.*, 1936, 191: 271.

The author points out that the causes of death from diphtheria fall into three classes: (a) asphyxia, (b) bronchopneumonia, and (c) toxic myocarditis. Asphyxia is mainly due to involvement within and below the larynx and calls for tracheotomy or intubation. Diphtheria antitoxin alone seldom saves the patient. He believes that the frequency of bronchopneumonia in the disease can be held at a minimum if minute attention is paid to cleanliness of hands and instruments when performing intubations, and if correct methods of feeding are followed for patients wearing intubation tubes. It is claimed that diphtheritic myocarditis can often be prevented by the use of 10 per cent dextrose solution intravenously, provided this treatment is begun early and continued daily. In a group of 83 patients at the Municipal Contagious Disease Hospital of Chicago suffering from malignant diphtheria the mortality rate was only 12 per cent under this treatment. This contrasts with a 30 to 60 per cent mortality by other methods of treatment. Excluding 2 patients practically moribund when admitted the mortality would be still further reduced. Further, the average dose of diphtheria antitoxin for the patients in this group was only 39,500 units. The author believes that the dextrose solution aids recovery by providing ready nourishment for the heart muscle, and thus lessens passive congestion of the liver.

E. S. MILLS

Hygiene and Public Health

Prevention of Intravenously Inoculated Poliomyelitis of Monkeys by Intranasal Instillation of Picric Acid. Armstrong, C., *Public Health Rep.*, 1936, 51: 241.

Experimental and epidemiological considerations indicate that the usual natural route of infection in poliomyelitis is from the nose by way of the olfactory tract. The author reports the results of an experiment which suggests that the instillation of 1.5 c.c. of 0.32 per cent picric acid in saline protects monkeys against the development of poliomyelitis after the injection intravenously of virus. Nine animals were treated in this way, of whom 2 developed poliomyelitis. Among the 9 controls 6 developed the disease.

FRANK G. PEDLEY

Urine Sulphate Determinations as a Measure of Benzene Exposure. Yant, W. P., Schrenk, H. H., Sayers, R. R., Horvath, A. A. and Reinhart, W. H., *J. Indust. Hyg. & Toxicol.*, 1936, 18: 69.

The commonly used criteria for detecting chronic benzene poisoning are the hæmoglobin content of the blood and the number of red and white cells in the blood as well as certain differential studies of the cellular elements of the blood. These criteria are useful in detecting poisoning when it is well developed, but do not indicate early stages. In order to find a means whereby a much earlier stage of benzol poisoning might be discovered the authors studied the blood and urine changes in dogs exposed to toxic concentration of benzol vapours. They found an early and marked drop in the inorganic sulphates in the urine in terms of the total sulphates present. The blood changes in the dogs occurred considerably later.

The mechanism of this reduction is believed to be due to oxidation of the benzol to phenol which is conjugated in the liver with sulphate ions, to form ethereal sulphates. It is suggested that this method for the early detection of benzol absorption should be applied to human subjects in industry in order to determine its reliability and practicability.

FRANK G. PEDLEY

Pathological Studies on the Organic Effects of Various Hydrazine Derivatives. Hueper, W. C., *J. Indust. Hyg. & Toxicol.*, 1936, 18: 17.

The gross and microscopic findings in the case of rats poisoned by 4 phenyl hydrazine derivatives, are given.

In one group the animals had received the poison by subcutaneous injection; in a second group the material was painted on the skin of the animals. The animals which were injected, developed more or less severe degenerative lesions in various organs. Rapid death is ap-

parently caused by marked circulatory and metabolic disturbances; delayed death is mainly the result of extensive organic degenerations and necrosis in various organs. In the case of the animals whose skin had been painted with the material, poisoning had not been severe enough to produce death. The pathological changes noted were slight and consisted of a moderate hyperplasia of the spleen and the presence of a moderate amount of brown pigment in the tubular epithelium of the kidney.

FRANK G. PEDLEY

On the Relation Between the Chemical Constitution and Pharmacological Action of Phenylhydrazine Derivatives. von Oettingen, W. F. and Deichmann-Gruebler, W., *J. Indust. Hyg. & Toxicol.*, 1936, 18: 1.

Phenylhydrazine is used extensively in chemistry, in industry, and to a limited extent in medicine. Pharmacologically it causes destruction of erythrocytes producing methæmoglobinæmia. It has therefore been found of some use in the treatment of polycythæmia. It is also a general protoplasmic poison and an active skin irritant.

In industry a great many derivatives of phenylhydrazine are used. Eleven of these compounds have been studied in regard to their toxicity on subcutaneous injection, their irritant effect on the skin, their anæmiogenic action and their effect on blood pressure, respiration and blood pigment at elevated temperatures.

FRANK G. PEDLEY

News Items

Great Britain

British Medical Association One Hundredth and Fourth Annual Meeting

The one hundredth and fourth Annual Meeting of the British Medical Association will be held in Oxford this year under the presidency of Sir E. Farquhar Buzzard, Bt., M.D., Regius Professor of Medicine in the University. His presidential address will be delivered on July 21st, and the sectional meetings will be held on July 22nd, 23rd and 24th. The mornings will be devoted to papers and discussions and the afternoons to demonstrations. Registration will be at the Morris Garages, St. Aldate's. The Ladies' Club and Reception Room will be at Rhodes House, South Parks Road. The clinical and scientific work will be divided among twenty Sections, meeting at the University Museum.

The local General Secretary is Dr. F. G. Hobson. All information can be obtained from the Secretary, British Medical Association Office, Keble Road, Oxford. The Randolph Hotel is the official British Medical Association hotel.

Dr. Griffith Evans.—The authorities of the University College of North Wales, Bangor, are planning to establish a memorial to the late Dr. Griffith Evans, who was the first lecturer on veterinary hygiene in

that institution. Doctor Evans, who was a graduate of McGill University, died last December having passed his hundredth anniversary by four months. He was regarded as the father of the veterinary profession, and was distinguished for his researches in the scientific field of medicine. The memorial will take the form of a new wing to the veterinary department of the School of Agriculture in the College, to be named The Dr. Griffith Evans Memorial Wing.

The book entitled "Practical Biochemistry for Students of Medicine", written by Drs. A. T. Cameron and Frank D. White, has obtained much acceptance in Great Britain, having reached its third edition (J. and A. Churchill, Ltd., London, 8s. 6d.). The work has been favourably reviewed, as it covers the ground in an attractive and efficient manner. No extensive changes have been made in the new edition, but careful revision has brought the subject-matter up to date.

A French Tribute to British Research.—The President of the French Republic has been pleased to confer upon Sir Henry Wellecome, LL.D., F.R.S., la Croix d'Officier de la Légion d'Honneur. This decoration is a further tribute to British medical and chemical research to which Sir Henry has made many notable contributions.

Alberta

The President of the Canadian Medical Association, Alberta Division, Dr. D. S. Macnab and Dr. R. R. Hughes, of Calgary, attended meetings of the local medical societies at Claresholm and Blairmore. In addition to each giving a scientific paper, Dr. Macnab discussed the question of closer organization.

On April 19th, the Medicine Hat District Medical Association met at Brooks, when Dr. W. Merritt and Dr. A. J. Fisher, of Calgary, presented scientific papers.

The Alberta Medical Association, in cooperation with the Faculty of Medicine of the University of Alberta, gave a "refresher course", commencing on May 11th, and finishing on May 15th. On the afternoon of the latter day the annual convocation of the University was held, so that visiting physicians were able to attend that function.

A District Medical Meeting was called to meet at Edmonton on May 12th, to organize a District Association taking in the country points west, north and north-east of Edmonton, in what would be called the territory tributary to that City.

Recently the Council of the College of Physicians and Surgeons met in Edmonton, the business being mostly of a routine nature. One question up for discussion was that of municipalities making contracts with hospitals, whereby on payment of a 75 cents per day rate for all patients going from the municipalities to the hospitals the hospital would not charge the municipality anything extra for the care of indigents, it being understood that the hospitals were free to collect accounts from all patients who are able to pay. Complaint was made that while the municipalities made arrangements for paying hospitalization they made no provision for paying the medical practitioner for his care of the indigents. No conclusion was arrived at, the matter being sent to Committees who would report at the next meeting of the Council.

The Hon. Mr. Manning, Provincial Secretary, has announced that it is the intention of the Government to make some provision to pay for the hospitalization and medical care and treatment of victims of motor car accidents; the money will come from the fund created

by doubling the driver's license fee, and making it an annual one.

The chiropractors had an amendment put through the Legislature, whereby, the two medical representatives on their Board are replaced by two chiropractors; thus the Board will stand composed of five, four of whom will be chiropractors and the other will be a layman.

The Legislature passed an amendment to the Hospitals' Act facilitating the entrance of patients into the hospital, in case of urgent necessity.

G. E. LEARMONTH

British Columbia

Dr. Stewart Murray, D.P.H., was appointed to the Vancouver School Board Medical Department as psychiatrist. Dr. Murray will be a full-time employee and his salary has been set at \$4,000 per annum, less existing School Board reductions. It was also provided that his salary should not exceed the maximum of \$4,800 per annum.

There have been a large number of cases of rubella and mumps during the month of March. There were 2,173 cases of rubella and 363 of mumps reported by the School Board amongst pupils of city schools in Vancouver, as compared with 2 cases of rubella and 32 cases of mumps in March, 1935.

The report of Dr. W. H. Walsh, of Chicago, who has recently made a survey of the Vancouver General Hospital, has been submitted to the Vancouver City Council. A \$1,500,000 program, designed to bring the accommodation and facilities of the Vancouver General Hospital to an adequate standard including construction of the new 500-bed building for acute cases, was presented to the Civic Finance Committee. The Chairman of the Board of Directors of the Hospital states that the hospital for some time past has been working both personnel and equipment beyond the normal factor of safety, and that factor has now been so far exceeded that the hospital is operating continuously on an emergency basis. The scheme submitted by Dr. Walsh, it is stated, will require six months for planning and nine months for construction. Dr. Haywood, general superintendent of the hospital, considers that these estimates are optimistic.

The British Columbia Cancer Foundation has been granted affiliation with the British Empire Campaign Headquarters in London, it is announced by Mr. E. W. Hamber. Mr. Hamber who is president of the Foundation, has recently been appointed and sworn in as Lieutenant-Governor of British Columbia.

The Coast Steamship *Princess Maquinna*, while off the coast of Vancouver Island recently, celebrated the third visit of the stork. A boy was born to one of the passengers and fortunately with the assistance of a trained nurse, who happened to be on board, the mother and child were given good attention. Upon arrival in Victoria the ship was met by a physician and ambulance, who took them to the Jubilee Hospital, where they were reported doing well. Two other children have been born on the *Maquinna* on previous voyages.

D. E. H. CLEVELAND

Manitoba

In a judgment given on April 20th by Mr. Justice Dennistoun, Dr. Omer G. Hague, radiologist of Winnipeg, was awarded \$849.99 in an action brought by him against the Sisters of St. Boniface Hospital. When the question of euthanasia was being discussed in England an interview with Dr. Hague appeared in

a local paper on November 8, 1935, in which the doctor strongly favoured legalized euthanasia. After the publication of the interview the Sisters of St. Boniface Hospital where Dr. Hague served as radiologist, notified him that his services were no longer required and paid him one month's salary. Dr. Hague brought action for \$3,116.63, a year's salary, for alleged wrongful dismissal. The Court found that without evidence to show that the plaintiff violated the moral code by which all Catholic hospitals are governed the dismissal without "reasonable notice" was not justified. The plaintiff, as a professional man, had a right to express his opinion on a scientific subject in a newspaper or otherwise. ROSS MITCHELL

New Brunswick

The Association of Officers of the Medical Services of Canada, New Brunswick Branch, at their quarterly meeting in April, listened to an address by Major A. S. Kirkland, entitled "Genghis Khan as a Cavalry Leader". The meetings of this Association are attracting an increasing number of interested physicians, and the success of this branch is definitely ascribable to the interest shown by the G.O.C. and the D.M.O. of the District, as well as to that of the individual members.

A complimentary dinner to Dr. Joseph Tanzman and Dr. D. W. F. Porter at the Union Club in Saint John was enjoyed by the members of the Saint John Medical Society. These two gentlemen have recently become benedicts.

Dr. Harold E. Baird, who previously practised in Chipman, has transferred his practice to Centreville, Carleton County.

Dr. F. M. Brown, Centreville, is a patient in the Fisher Memorial Hospital at Woodstock.

Dr. L. M. Curren, one of the best known of the senior surgeons of Saint John, is still confined to hospital following a serious abdominal operation.

Dr. George Lyons, of Moncton, has recently spent some time in post-graduate work in Boston.

Dr. Alphonse Sormany has been re-elected mayor of Shediac. A. S. KIRKLAND

Nova Scotia

Dr. E. K. MacLellan, Dalhousie Professor of Obstetrics, was elected president of the Halifax Branch of the Nova Scotia Medical Society at its annual meeting on April 30th. The Vice-president is Dr. Ralph P. Smith, provincial pathologist. Drs. W. G. Colwell, P. S. Campbell, G. A. Winfield and N. B. Coward form the new executive. Dr. Clyde Holland continues as secretary-treasurer.

Despite Government efforts of recent years, there are still some two thousand cases of pulmonary tuberculosis "running wild" in this province, according to Dr. Charles Beckwith, assistant medical superintendent of the Nova Scotia Sanatorium.

The *Dalhousie Medical Journal*, an undergraduate publication, Vol I, No. 1, appeared in April. Its emblem is that of the under-graduate medical society, a hand bearing a pine cone. The pine cone is the most ancient known symbol of the healing art. The Greeks adopted the symbol from the Egyptians, and Æsculapius is sometimes represented as holding a pine cone in his left hand, the right bearing the familiar

caduceus. The *Journal* in appearance and tenor shows the true professional touch.

Dr. Hugh MacKinnon, a native of Lake Ainslie and a graduate of Queen's, is taking over the North Sydney practice of the late Dr. J. W. MacLean.

Their columns crowded with stories of the Moose River disaster, local presses have found space to voice their indignation over the importation of the Præverx and Inductotherm used in the treatment of Alfred Scadding. These apparatuses, they claim, could have been, and should have been, procured locally.

Dr. C. M. Bethune (Dal., '31) has received an appointment in anæsthesia to the Visiting Staff of the Victoria General Hospital. Doctor Bethune recently resigned from the resident staff where he has served for the past five years. He will take up the practice of his specialty in Halifax.

Dr. O. B. Keddy, surgeon and mayor of Windsor, N.S., for thirteen years, was tendered a banquet and presentation by the citizens of Windsor in appreciation of his long, public service.

Kentville, home of the Nova Scotia Sanatorium, is to have a general hospital, and the sum of \$33,000 has been allocated for that purpose. A. L. MURPHY

Ontario

Expenditures totalling about \$12,000 have been authorized by the Trustees of the Galt Hospital Trust. This money will be expended to provide an improved maternity section and an isolation ward.

The Provincial Department of Health announced that, on June 1st, there will be a diagnostic clinic for tuberculosis and diseases of the chest at North Bay.

A recent statement from the Provincial Department of Health recorded 17,944 hospital beds in the Province, including public, private, and veterans' hospitals. Of these, 11,050 were occupied by patients with a diagnosis of insanity or mental deficiency.

On April 14th, the Honourable Dr. Bruce, Lieutenant-Governor of the Province, in the presence of 300 representative men and women, opened the new wing of the Kitchener-Waterloo Hospital.

The Board of Health of the City of Peterborough has ordered plans for the conversion of the Queen Mary Isolation Hospital into a sanatorium for the treatment of Peterborough patients who at present must be treated elsewhere.

In commemoration of the achievements of Sir William Osler, the Hamilton Academy of Medicine has instituted a scholarship to be competed for annually by McMaster University students who intend to proceed to the study of medicine. It is necessary for each competitor to provide an essay of from 3,000 to 4,000 words on the life and work of this great physician. Students in senior and junior years will be eligible. The prize is \$50.00, to which an additional \$50.00 will be added after the successful completion of the first year of the medical course.

April 29th was the date of the annual Clinic and Demonstration of the Hamilton General Hospital, in which 54 surgeons and physicians collaborated, demonstrating the various diseases and their complications, with methods of treatment. Some 800 Ontario physicians attended the Clinic. J. H. ELLIOTT

Saskatchewan

Hon. J. M. Uhrich, Minister of Health, in the budget debate in the house, stated that the present was not the time to inaugurate a system of state medicine. The municipalities are now 35 million dollars in tax arrears and five hundred thousand dollars behind in the tuberculosis levy; they are five million dollars behind in public revenue tax payments. "If the municipalities cannot carry the tax load that they now bear how can they carry more?" asked the Minister. The Saskatchewan treasury is already contributing to the public health services more than the equivalent of the two-ninths contribution required under the proposed British Columbia scheme.

Dr. Uhrich gave the house a complete review of the work of his department. Activities of the sanitation division are directed towards ensuring that the health of the people will not be undermined by polluted water supplies, infected milk, impure food or unsanitary surroundings. The supervision of water and sewage services is entrusted to engineers and inspectors of the division of sanitation. During the past year 1,153 individual written opinions were given regarding the safety of farm water supplies, and recommendations were made as to the method of improving the quality of the sources of these supplies.

Municipalities have power under the Public Health Act, to pass by-laws requiring all milk sold to citizens to be pasteurized. The Minister urged that municipal councils take advantage of this legislation.

Cooperative effort between officials of the sanitation division and inspectors of the Dominion health of animals branch is being maintained in the testing of cattle for tuberculosis and contagious abortion. An increase in undulant fever has taken place. In 1933 there were 6 cases and no deaths; in 1934 there were 28 cases and 2 deaths; in 1935 there were 35 cases and 4 deaths.

The staff of public health nurses has been reduced to eleven, but these eleven nurses have during the year visited over 400 schools and have inspected 150,000 children. In addition, these nurses made 5,500 home visits; they also assisted the medical health officers in the immunization of children in one hundred and eleven schools. The public health nurses organized 20 dental clinics and assisted at 96 additional dental clinics.

A dental fund of \$1,500 made up of contributions from the Saskatchewan Dental Society, the Canadian Dental Hygiene Council and the department of public health, is being administered by representatives of these three bodies. Last year 96 schools, all in relief areas, were assisted by this fund. The districts contributed \$678.

Dr. Uhrich quoted from a report of the superintendent of the Anti-Tuberculosis League that "slowly but steadily this dread disease (tuberculosis) is being reduced year by year". Two main obstacles in wiping out the disease are that two-thirds of the population are still using milk supplies from cattle from which tuberculosis has not all been eliminated, and, second, that the disease is still very prevalent among the Indians, where effective methods of control have not yet been instituted. Saskatchewan has the lowest death rate from tuberculosis of any of the provinces.

The province is now paying for health services \$2,500,000 annually.

Dr. R. L. King was host to the April meeting of the Prince Albert Medical Society. Dr. R. W. Kirkby gave a paper on "Heart irregularities"; each case was described as to etiology and diagnosis and classed as major and minor. Digitalis and quinidine therapy were discussed. He described the uses and limitations of the electrocardiograph.

A case of meningococcic meningitis with fatal outcome was presented at the Grey Nuns' Staff luncheon by Dr. J. T. Waddell. In discussing the case Dr. Urban Gareau said that in the last ten years he had treated 10

cases of meningitis; 4 of these recovered. Treatment is the administration of meningococcic antitoxin, intrathecally 20 c.c., and intravenously 10 c.c., daily.

LILLIAN A. CHASE

General

The International Union Against Tuberculosis.—The Xth Conference of the International Union against Tuberculosis (Secretary-General Prof. Fernand Bezançon) will meet in Lisbon from September 7 to 10, 1936, under the chairmanship of Prof. Lopo de Carvalho. The discussion will be limited to three main subjects: Biological subject: "Radiological aspects of the pulmonary hilum and their interpretation", opening report by Prof. Lopo de Carvalho (Portugal). Clinical subject: "Primary tuberculous infection in the adolescent and the adult", opening report by Dr. Olaf Scheel (Norway). Social subject: "The open case of tuberculosis in relation to family and domestic associates", opening report by Drs. G. J. Hatfield (United States) and D. A. Powell (Great Britain). Ten speakers, selected in advance from a list presented by the 44 countries belonging to the Union, have been designated to open the discussion on each of the questions on the agenda.

The Organization Committee of the Conference has prepared a very attractive program of receptions and excursions. The latter will enable members of the Congress to visit the chief anti-tuberculous institutions as well as the most picturesque scenery in various parts of Portugal.

Members of the International Union are invited to take part in the Conference free of any contribution fee. They may forward their applications either through the medium of their Government or their National Organization against Tuberculosis, or directly to the Organizing Committee in Lisbon, at the following address: Organizing Committee of the Xth Conference of the International Union against Tuberculosis, Assistencia Nacional aos Tuberculosos Avenida 24 de Julho, Lisbon (Portugal).

Names may also be sent to the Headquarters of the Secretariat of the International Union against Tuberculosis, 66, Boulevard Saint-Michel, Paris (6ème).

Persons who are not members of the Union and who wish to take part as "Members of the Conference" must forward their application, together with a contribution of 200 escudos (approximately 125 French francs), exclusively through the medium of Canadian Tuberculosis Association, Plaza Building 304, Ottawa.

Reductions on hotel prices and railway fares will be granted to members of the Congress.

The following gentlemen will open the discussions.

Biological subjects.—Austria, Dr. Ludwig Hofbauer; Czechoslovakia, Dr. A. Hoffmann; France, Prof. Emile Sergent, Drs. L. Delherm and P. Cottenot; Germany, Prof. Dr. H. Kleinschmidt; Great Britain, Dr. W. T. Munro; Italy, Prof. Aristide Busi; Lithuania, Dr. L. Koganas; Poland, Prof. W. Zawadowski; United States, Dr. H. C. Sweany.

Clinical subjects.—France, Dr. J. Troisier; Germany, Dr. Redeker; Great Britain, Dr. L. S. T. Burrell; Hungary, Dr. Géza Gali; Roumania, Drs. S. Irimescu and M. Nasta; Spain, Prof. L. Sayé and Dr. Tapia; Sweden, Dr. H. Ernberg; United States, Dr. Robert E. Plunkett; Yugoslavia, Dr. Yevrem Nedelkovitch.

Social subjects.—Belgium, Dr. Willems; Finland, Dr. Severi Savonen; France, Drs. P. Braun and Albert Bezançon; Germany, Dr. Braeuning; Italy, Prof. Gioacchino Breccia; Netherlands, Dr. H. R. Gerbrandy; Norway, Dr. Nils Heitmann; Poland, Dr. Janina Misiewicz; Portugal, Dr. Ladislav Patricio; Switzerland, Dr. J. Morin.

Full information may be obtained by applying to the International Union against Tuberculosis, 66 Boulevard Saint-Michel, Paris (6e).

2 Important Announcements

● EMMENIN TABLETS

Emmenin is now available in tablet form. This convenient method of administering Emmenin will appeal to many physicians because of the simplicity and accuracy of the dosage, each tablet representing one teaspoonful of Emmenin Liquid.

IN BOTTLES OF 42 TABLETS

● PRICE REDUCTION ON EMMENIN LIQUID

Consistent with our policy of passing on to the consumer, savings effected in manufacturing processes, the price of Emmenin Liquid (32 doses) has been substantially reduced. Likewise, the price of the new Emmenin tablets has been based on this new lowered price.

AYERST, McKENNA & HARRISON, Limited

Biological and Pharmaceutical Chemists

MONTREAL

CANADA

Reorganization of the International League Against Epilepsy.—At the time of the International Neurological Congress in London a meeting of those particularly interested in epilepsy was held on July 31, 1935, at the Lingfield colony. Thirty-two doctors representing 14 countries were present. After discussion it was unanimously decided that the International League against Epilepsy should be revived. The immediate efforts should be directed towards the improvement of the social condition and the institutional care of persons with epilepsy. To this end it was agreed that a publication should be issued annually or oftener, acquainting readers with facilities and with remedial efforts carried on in various countries. Plans were also laid for a meeting of the League at the time of the next Neurological Congress in Copenhagen.

At an adjourned meeting held August 2, (Prof. A. Ley, of Brussels in the chair) the following officers were elected: *President*, William G. Lennox, Boston, U.S.A.; *Secretaries*, H. I. Schou, Dianalund, Denmark, L. J. J. Muskens, Amsterdam, Holland; *Treasurer*, Tylor Fox, Lingfield, Surrey, England.

All persons interested in improving the condition of epileptics are invited to join the League. Membership, which includes subscription to the periodical, is the equivalent of 5 shillings a year, or 15 shillings for the four year period.

The Rockefeller Foundation.—The Rockefeller Foundation expended \$12,679,775 during the year 1934, according to its annual report, which has been published recently. In commenting upon the activities of the year, Max Mason, president of the Foundation, said in part:

"The determination of sound Foundation procedure in the application of funds to the well-being of man becomes unusually difficult when increased opportunity and need coincide with diminished resources. Such a situation, at a time of rapid change in world conditions, demands the careful thought of those responsible for the selection of the fields and methods of work which promise to yield the most tangible and lasting benefits.

"The decisions reached during the year 1934 as to program in the immediate future bring increased emphasis on special fields, and on realistic research designed to meet definite and clearly recognized needs."

The grants of the Foundation included five broad fields of scientific endeavour. Public health activities were supported during 1934 by a budget of \$2,200,000. Work in the medical sciences received a total of \$1,026,200. The natural sciences were aided by \$1,051,210. The social science program received appropriations totaling \$1,164,690. The field of the humanities was given grants amounting to \$749,500.

The summary of the Foundation's work during 1934 in the field of public health as given in the annual report is as follows:

"Operating on a budget of \$2,200,000 for public health activities, The Rockefeller Foundation in 1934 engaged in field research on yellow fever, malaria, hookworm disease, tuberculosis, undulant fever, yaws, and diphtheria; conducted yellow fever surveys and control campaigns; carried out projects in malaria control, supported numerous demonstrations of complete public health programs; gave aid to the organization or maintenance of essential services of state and national health departments; and continued its contribution for the training of public health personnel through aid to schools and institutes of hygiene and public health as well as by support of a fellowship program."

The Foundation's support of work in the medical sciences, totaled more than a million dollars and included the following projects:—

"Aid of four types was given for the advancement of psychiatry: grants to universities and other institutions for the development of research and teaching in psychiatry and associated subjects; endowment and

building funds for establishing psychiatric departments; research aid grants to individual workers engaged in important investigations in mental diseases; and fellowships to enable men and women especially qualified for work in this field to obtain desirable advanced training.

"Grants for work in psychiatry were made to McGill University for research and teaching; to the Massachusetts Department of Mental Diseases for studies in psychiatry at the Boston State Hospital; to the Worcester State Hospital, Massachusetts, for research on dementia præcox; to the Johns Hopkins University, for the development of child psychiatry in the paediatric clinic; to the University of Leiden, for child psychiatry; to the Chicago Area Project, for the study, treatment, and prevention of juvenile delinquency within a few selected areas in Chicago; to the University of Rochester, for the Child Guidance Clinic; to the National Committee for Mental Hygiene, towards support of its general expenses during 1935; to the University of Colorado, for the teaching of psychiatry in the medical school; to the University of Michigan; and the Institute of the Pennsylvania Hospital, for the development of teaching and research in psychiatry.

"For work in neurology and related subjects, gifts were made to New York University, to Northwestern University Medical School, the University of Pennsylvania, the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne, Australia, Dartmouth College, and the Lister Institute of Preventive Medicine, London."

The Thirty-eighth Annual Meeting of the Medical Library Association will be held in St. Paul, Minn., June 22 and 23, 1936, and in Rochester, Minn., June 24. Sessions will be held at the Ramsey County Medical Society, New Lowry Medical Arts Building, St. Paul, and at the Mayo Clinic, Rochester.

The program will include addresses, discussions, and demonstrations on library procedure, medical history and literature.

This Association consists of about 175 of the medical libraries of this country and Canada, together with their librarians and a group of supporting members who are physicians interested in the advancement of medical libraries.

The officers of the Association are as follows: *President*, Dr. W. W. Francis, Montreal; *Vice-president*, Dr. A. H. Sanford, Rochester, Minn.; *Secretary*, Miss Janet Doe, New York; *Treasurer*, Miss Mary Louise Marshall, New Orleans; *Chairman of Executive Committee*, Miss Marjorie J. Darrach, Detroit.

All interested in the development of medical libraries and a wider knowledge of medical literature are invited to attend.

The First International Conference on Fever Therapy is to be held at Columbia University, New York City, from September 29 to October 3, 1936. The subjects to be discussed will include physiological and pathological changes as well as the treatment of gonorrhœa; gonorrhœal and non-specific arthritis; syphilis; neurological conditions such as multiple sclerosis, chorea, paresis, tabes; skin diseases, etc.

The meeting will be held under the chairmanship of Baron Henri de Rothschild of Paris, France. The French Committee, of which Professor d'Arsonval is Honorary President, is under the chairmanship of Professor Abrami. The American Committee consists Drs. Desjardins, Bierman, Hartman, Hinsie, Neymann, Simpson and Warren. National European Committees are being formed under the direction of Professors Maranon, of Spain, Frugoni, of Italy, Volhardt, of Germany, Wagner-Jauregg, and Eppinger, of Austria, Michaux, of Switzerland, Bessemans, of Belgium, and Danielopolu, of Roumania.

Information regarding this Conference may be secured from the General Secretary, Dr. William Bierman, 471 Park Avenue, New York City, U.S.A.

Don't Depend on Symptoms Alone

SYMPTOMS alone are not always reliable in the diagnosis of alimentary tract disease. Hemorrhage, dyspepsia, pain—one or all may be merely incidental, or absent altogether. Often, gastric disturbance is the reflex indication of lesions elsewhere in the alimentary tract or in the gall-bladder.

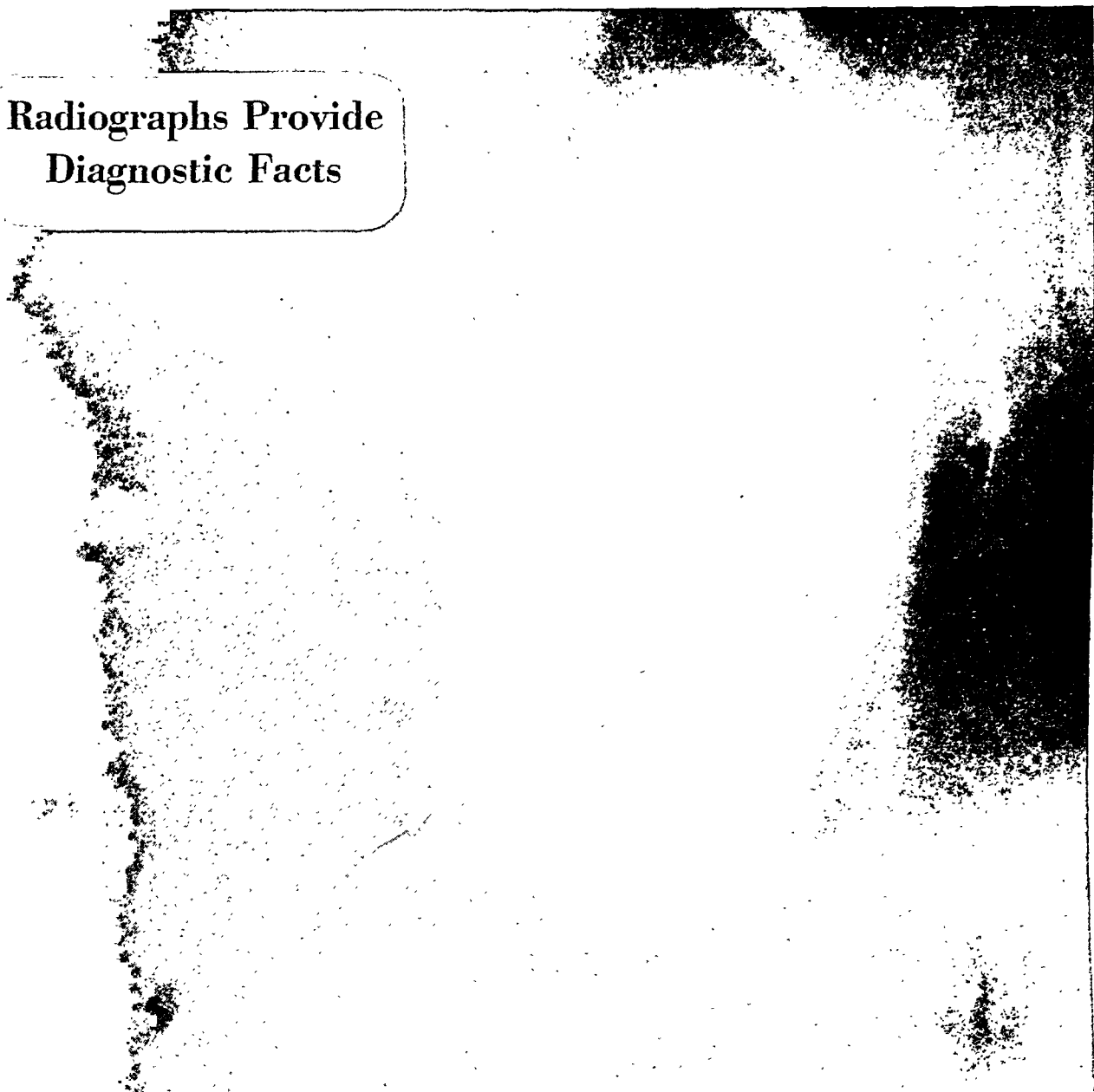
X-ray examination of the *entire* digestive tract is a dependable means of assuring accuracy in diagnosis. For ex-

ample, even though a diagnosis of gastric cancer has been made, radiographs may show likewise that another viscus is affected—findings that may contraindicate operation. Equally important, a gastric lesion may be disclosed when signs point to colonic involvement.

Depend on complete x-ray examination to check your diagnosis . . . Refer to your radiologist every case of suspected alimentary tract involvement.

CANADIAN KODAK CO., LIMITED, TORONTO, ONTARIO

Radiographs Provide
Diagnostic Facts



Book Reviews

Tumours of the Urinary Bladder. Edwin Beer, M.D., F.A.C.S., Visiting Surgeon, Mount Sinai Hospital. 157 pages, illustrated. Price \$3.50. Wm. Wood, Baltimore, 1935.

The work of Dr. Beer in the therapy of bladder tumours is sufficiently outstanding that any utterance of his on this subject merits careful attention. His application of transurethral electro-coagulation with a monopolar or bipolar current marked an epochal advance in the treatment of these conditions. In the 25 years since he first applied the Oudin current to a bladder tumour through the cystoscope, his activities in this field have been continued.

In a recently published monograph he has collated his experiences in an interesting and adequate manner. He has laid most emphasis upon treatment and the larger portion of the book is concerned with this aspect of the subject. The study is based upon 650 cases of bladder tumour which had been treated in his clinic by various methods, used alone and in combination. The author very properly declares against "dogmatism and strict adhesion to any one form of treatment", and pleads for a proper selection of treatment in accordance with the condition presenting itself. Electro-coagulation, radium implantation, bladder resection have all been used. The manner of approach has been transurethral or suprapubic, and the various forms of treatment have been combined in individual cases. In a small number of cases even a complete cystectomy with implantation of the ureters in the skin has been practised with encouraging results.

The monograph is printed in an attractive form, is well illustrated, and an extensive bibliography is included. It is a creditable publication, and can be warmly recommended to our readers.

Chronic Nasal Sinusitis. F. A. Pickworth, B.Sc., M.B., B.S., A.I.C.(Exam.), Director, Joint Board of Research for Mental Disease, City and University of Birmingham. 156 pages, illustrated. Price 16s. net. H. K. Lewis, London, 1935.

Following the introductory chapter, the author proceeds to a description of the anatomy and physiology of the nasal sinuses. He stresses not only their close proximity to the cranial cavity but also the close anatomical relationship to the cranial cavity in the respect of blood vessels and nerves, with special reference to the close proximity of the sphenoid sinus to the pituitary gland, carotid artery, cavernous sinus, etc. He emphasizes the fact that diseased sinus membrane allows rapid absorption of toxins, whereas if the sinus membrane is healthy and the cilia are functioning normally absorption is prevented.

In an examination of 1,367 sinuses by the Watson-Williams technique of puncture and saline suck-out it was found that only 353, or 25 per cent, were sterile. Normally the sinuses are quite sterile. Of these cases the sphenoid sinuses were the worst offenders. Cultures taken from the sphenoidal sinus within two hours of death showed organisms in 76 per cent. The author stresses the importance of vascular changes in the brain in all types of insanity and points out the possible relationship of chronic focal sepsis to cerebrovascular disease, special reference being made to sphenoidal sinusitis. This book should be a stimulus to a more thorough investigation of nasal sinuses, not only in mental disorders but in other diseases.

Infant Nutrition. W. McKim Marriott, B.S., M.D., Professor of Paediatrics, Washington University School of Medicine. Second edition, 431 pages, illustrated. Price \$5.00. C. V. Mosby, St. Louis; McInsh, Toronto, 1935.

This edition is, like the first, a comprehensive, clearly written, and authoritative survey of the nutri-

tional needs of the infant. It covers most satisfactorily the feeding of the normal infant, as well as the feeding of the infant whose nutrition has suffered from any cause, be it infectious or metabolic.

A few changes are worthy of note. Anhydremia, acidosis, and alkalosis are now discussed under those conditions of which they are symptoms. Under vomiting pyloric stenosis is discussed also. This treatment has resulted in a somewhat smaller volume, but has avoided repetition. Allergic reactions to foods are discussed broadly in one chapter and also, rightly so, in the chapter on vomiting. The chapter on vitamins has been rewritten and is much more acceptable in this presentation.

Acid milk feeding and coeliac disease have also been rewritten in a much clearer way. The diet suggested in the early stages of the latter condition, however, would appear to be too liberal for the average case of true coeliac disease. The book is to be commended.

John Whitridge Williams—Academic Aspects and Bibliography. J. Morris Slemmons. 109 pages. Price \$1.50. Johns Hopkins Press, Baltimore, 1935.

This publication is the presidential address given by Dr. Slemmons before the Pacific Coast Society of Obstetrics and Gynaecology. Most of us have learned to know Williams by his textbook, and many have undoubtedly grown curious as to the manner of man he was—this great master of obstetrics. Here is an all too brief sketch by an old pupil and associate. It is a sincere and reserved tribute to a great preceptor. The time allowed to the original presentation undoubtedly affected its full maturation, so that one is left with a desire to learn more of this man, who had so much to do with the development of scientific obstetrics in Johns Hopkins.

Agents of Diseases and Host Resistance. F. P. Gay and others. 1,581 pages; illustrated. Price \$10.00. C. C. Thomas, Springfield and Baltimore, 1935.

This book is the result of the collaboration of several authors under the coordinating influence of Prof. F. P. Gay. It is provided with all the advantages of the special knowledge possessed of selected individuals, but the disadvantage of inequality in strength is not so noticeable in the different sections as is usual in works of this kind.

The book is in very truth "a mine of information" made available in a most readable form, and, to the benefit of inquiring minds, the more important sources of this information are given in lists of references at the end of each chapter. But the book is more than this, for it is marked throughout by that indefinable stimulating quality, born of the enthusiasm of a real master, which is evidenced most particularly in the clear statement of principles rather than in summarizing existing knowledge and describing practical applications. A careful analysis and evaluation of available information is evident in the balanced description and discussion of the various subjects. There is no semblance of an attempt to gloss over the difficult and controversial problems of today; they are sometimes simplified by a search for underlying general principles, and this treatment is more illuminating than the more usual detailed discussion of the confusion of ideas in which many such problems are imbedded. However, those particularly interested in certain subjects in some cases will have the personal opinion that the emphasis is unsatisfactorily placed or that their treatment is incomplete; for example, certain might feel such dissatisfaction with the treatment of the *Salmonellas*, the *Corynebacteria* other than *Cor. diphtheriae*, and, rather surprisingly, perhaps, *Staphylococcus*. But the field covered by the book is so vast that many subjects have been treated succinctly of necessity. The preface and opening chapters of the

*Recommended by the
Medical profession*



for DISORDERS OF THE LIVER,
BLADDER AND KIDNEYS,
RHEUMATISM, ARTHRITIS

BOTTLED UNDER GOVERNMENT SUPERVISION AT THE SPRINGS

**VICHY
Célestins**

Sales Agent: HERDT and CHARTON INC.
2027 McGill College Ave., Montreal 11 King Street W., Toronto

Classified Advertisements


WANTED—The College of Physicians and Surgeons of Saskatchewan, and the Saskatchewan Medical Association, invite applications for the dual position of Registrar of the College of Physicians and Surgeons of Saskatchewan and Secretary-Treasurer of the Saskatchewan Medical Association. Applications will only be considered from fully qualified medical practitioners, and are to be submitted to Dr. B. M. Bayly, President of the College of Physicians and Surgeons, Moose Jaw, Saskatchewan, before July 1st, 1936. Duties are to be assumed January 1st, 1937.

WANTED, situation in Toronto. Part time during academic year, full time during vacation. Neat, capable male graduate with one year's internship and three years' general practice. Will do anything ethical, night work, laboratory work, keep books, take dictation, look after office and drive. Fifteen dollars or more weekly. Apply Box 248, Canadian Medical Association Journal, 3640 University Street, Montreal.

X-RAY TECHNICIAN female, graduate nurse, teaching hospital, requires position, small hospital. Capable of taking charge of Department. Experience four years with radiologist, outstanding ability. Apply Box 250, Canadian Medical Association Journal, 3640 University Street, Montreal.

RADIUM FOR SALE by private treaty. The estate of the late Dr. R. H. Craig, Otorhinolaryngologist, of Montreal, offers 50 milligrams in metal containers; certified. A good opportunity to acquire radium at a much reduced price. Apply Box 249, The Canadian Medical Association Journal, 3640 University Street, Montreal.


FOR SALE—The following articles: Physician's leather bag, with three glass vials; stethoscope; instruments; desk baum; microscope; walnut desk and two office chairs practically new; Oriental office rug; nose and throat instruments. Apply Mrs. B. Thomas, 532 Euclid Avenue, Toronto, Melrose 3169.



**F. & R.'s
GENUINE
GLUTEN FLOUR**

Guaranteed to comply in all respects to standard requirements of the U.S. Department of Agriculture.

Manufactured by
THE FARWELL & RHINES CO.
Watertown, N.Y., U.S.A.



During Pregnancy and the Postpartum Period

supporting treatment is essential. Fellows' Syrup is the most logically prepared tonic at the disposal of the physician.

It contains all the required minerals in correct proportion and in an easily assimilable form. These are Manganese and Iron to renew the blood stream impoverished by continued loss; Calcium to replenish the constant calcium depletion; Potassium, Sodium, and Phosphorus to overcome the neural depression; Strychnine as a tonic to cell metabolism; and Quinine as a gastric stimulant.

There is no better tonic than Fellows' Syrup to the parturient and postparturient patient. During these trying periods, the suggested dose is one teaspoonful three times daily well mixed with water.

SAMPLES ON REQUEST

FELLOWS MEDICAL MFG. CO., LTD.

286 St. Paul Street, West, Montreal, Canada.

CONTAINS
THE
ESSENTIAL

MINERALS

SODIUM

POTASSIUM

PHOSPHORUS

CALCIUM

IRON

MANGANESE

FELLOWS' SYRUP
OF THE HYPOPHOSPHITES

book in which the supreme importance of etiology in the classification, description and understanding of diseases is stressed, without belittling the importance and usefulness of a knowledge of the course and results of disease processes, can be recommended with confidence to the reading of pathologist and clinician alike, and very few of us will not benefit. The clear-cut argument that the importance of changed structure has overshadowed the importance of changed function in the study of disease, and that both "have temporarily obscured the ultimately more important field of etiology" points a lesson of particular importance today.

The book cannot be too highly recommended to teacher and student alike, with the confidence that neither will be disappointed. The numerous illustrations are good and to the point, while those representing complicated conceptions diagrammatically should help the understanding of what is already clearly described. There is no difficulty in believing, with the authors of this book, that one man could not write it, dealing as it does with inanimate and animate agents of disease, in the widest sense of these terms. Truly, it deals with the chemical agents merely in outline, but with the immunological, bacterial, virus, fungous and animal parasite agents quite fully. The book is what might well be expected from Professor Gay, who has made so many important contributions to our knowledge of bacteriology and immunity.

Individual Exercises. G. T. Stafford, M.S., Director, Corrective Physical Education, University of Illinois; Harry B. DeCook, M.A., Director, Corrective Physical Education, Northwestern University; and Joseph L. Picard, M.S., Director, Corrective Physical Education, University of Arizona. 111 pages, illustrated. Price \$1.00. A. S. Barnes, New York, 1935.

The exercises described are those which are used in the departments of corrective physical education of the universities to which the authors are attached. A well-written chapter on the need for exercise opens the book, and is followed by outlines of three sets of exercises for various common conditions, presumably for use only after a medical examination and upon the advice of the examining physicians. One hundred exercises are described and illustrated by line drawings. This is a very useful book for physicians and others who wish to prescribe exercises as corrective measures.

The Practitioner's Library of Medicine and Surgery. Vol. IX., Neurology and Psychiatry. 1,202 pages, \$10.00. D. Appleton-Century Co. Inc., 1936.

The preceding eight volumes of this series were reviewed in the December, 1935, issue of this *Journal*.

The supervising editor states in the preface "The ultimate welfare of the patient with a 'nervous disease' often depends upon the alertness and insight of the physician whom the patient first consults. That practitioner must appreciate the personality make-up of his patient, and he must be made to recognize organic disease of the nervous system in its incipient clinical state." His approach to the understanding of the neuroses and the psychoses is by discussing the component parts of a personality, the principles underlying human behaviour, the conflicts and maladjustments within the normal range and psychopathic personalities. Psychoanalysis is critically surveyed, from the training of the analyst to the diagnostic and therapeutic value of this form of treatment. This is a thoroughly practical work on these two specialties. The neurological and psychiatric manifestations are discussed under each of the five main types of injury—infection, intoxication, neoplasms, trauma and vascular lesions. The etiological and pathological features of each disease process are prominently and clearly de-

picted. For example, in pyogenic meningitis the contributor recommends the injection of 2 c.c. of oxygen, or air, if oxygen is not available, prior to cervicolumbar irrigation with sterile isotonic saline combined with homologous polyvalent serum. And, in cases of suspected cerebral hæmorrhage the presence of bloody spinal fluid is sufficiently diagnostic to disprove the presence of cerebral thrombosis. The lessening of the cerebrospinal pressure by ten to fifteen mm. of mercury will decrease the depth of shock. This volume is a valuable addition to the series and is well worthy of being on any busy practitioner's reading list for the year 1936.

Child Psychiatry. Leo Kanner, M.D., Assistant Professor of Psychiatry, Johns Hopkins University. 510 pages. Price \$6.00. C. C. Thomas, Springfield and Baltimore, 1935.

This book is, according to the author, the first textbook of Child Psychiatry in the English language which attempts to cover the whole field of children's personality disorders on a broad, objective, unbiased and practical basis. It has grown out of the close cooperative relationship between the Departments of Pædiatrics and Psychiatry in Johns Hopkins Hospital. Appreciating fully the limitations of our present-day knowledge of the psychiatric problems of childhood, the author has refrained from making any attempts to categorize into rigid patterns the various manifestations of personality disorders in children and has related the available information on this subject to what he calls the somatic factor, the emotional, sex, constitutional and environmental factors. The main part of the book is devoted to a description of personality difficulties forming essential features or sequels of physical illness, the manner in which personality disorders in children may resolve themselves into the various types of hypochondriasis, and the forms in which emotional disorders may express themselves as whole dysfunctions of the individual in the form of jealousy, temper and fear reactions, faulty feeding habits, sleep disturbances, antisocial trends, and the more serious types of psychotic reactions. The section which is devoted to the principles and aims of psychiatric treatment is particularly valuable because of the practical way in which the treatment of these problems is presented. The psychobiological approach which the author utilizes here, the numerous case histories presented to illustrate the subject matter under discussion, and the very practical treatment measures advocated, should make this book a very valuable aid to all those physicians who are primarily interested in the treatment of the physical and mental disorders of childhood.

Roentgenology. Alban Koehler, Wiesbaden. Second edition translated by Arthur Turnbull, M.A., B.Sc., M.B., Ch.B. 681 pages, illustrated. Price \$15.00. Baillière, Tindall & Cox, London; Macmillan, Toronto, 1935.

This book, according to the author, is sometimes referred to as the "Bible of Roentgen-Rays". This is perilously close to hyperbole, but there is no doubt of the work's popularity, since it has been published in several different languages and has received the highest roentgen award in Germany, the Rieder Gold Medal. This is the second English edition, and the book is familiar to all interested in radiography. There is little to add to other favourable reviews, beyond commenting on the wealth of detail it contains. Too high commendation cannot be given to the plan of describing first the normal and then tracing the various early changes produced by disease. It is also refreshing to note the use made of line drawings in supplementing and even replacing reproductions of skiagrams themselves.

Essentials in **SERUM TREATMENT OF PNEUMONIA**

Determining the Type of Pneumococcus

Successful treatment requires the use of serum specific for the type of the causative pneumococcus. Using the Neufeld rapid method of typing a physician may determine the type in his office with the aid of a microscope or the typing may be done in hospital or other laboratories. A package containing typing sera is now supplied by the Connaught Laboratories. By the Neufeld technique the type may be determined within a few minutes.

Using an Effective Highly Concentrated Serum of Specific Type

Type I or Type II pneumococci are the causative agents in over 50 per cent of all cases of lobar pneumonia and for these type I and type II sera can be effectively employed. The serum is highly concentrated and the difficulties attendant on the use of large doses of unconcentrated antipneumococcus serum have been greatly reduced.

Proper Administration of Serum

Serum is administered intravenously in divided doses over a period of hours. Good results have been obtained when the serum has been administered with the minimum delay and in accordance with the directions. The quantity of serum required in treatment is dependent on the severity of the illness, time of treatment, etc., being on an average 200,000 units. Type I Concentrated Antipneumococcus Serum for treatment is supplied in vials containing 10,000 units and 20,000 units. Type II Serum is similarly supplied.

Outfit for the Rapid Typing of Sputum by Physicians

A package consisting of a supply in capillary tubes of Type I, Type II and Type III antisera sufficient for the performance of 3 tests and a solution of standard methylene blue, with details of the technique, is supplied by the Connaught Laboratories. The cost of the package is 30 cents.

CONNAUGHT LABORATORIES

University of Toronto

TORONTO 5

CANADA

The book will be welcomed by those who wish a guide in radiological interpretation, and also by the more experienced who wish a book of reference containing such a body of carefully digested, clearly presented facts.

Aphasia. T. Weisenberg, M.D. and K. E. McBride, Ph.D. 634 pages. Price \$5.00. Commonwealth Fund, New York, Oxford University Press, London, 1935.

This splendid volume, submitted for publication but a few weeks prior to the decease of the senior author, is the result of several years of detailed research by the late Dr. Theodore Weisenberg and his associates. The psychological aspect of the work was in charge of Dr. Katherine E. McBride. Conclusions are based upon the results of examination of 234 patients, of whom 167 formed three important groups; 62 showing definite aphasia; 21 with right-sided lesions without aphasia, and 85 selected from the surgical and orthopaedic wards used as control cases.

In the first 118 pages the authors review the literature extensively, discussing the various theories advanced on the subject. Two chapters describe the types of patient studied in the research and the methods of examination employed. One chapter is devoted to a discussion of classification. The authors group their cases into (1) a predominantly expressive group; (2) a predominantly receptive group; (3) an expressive-receptive group and (4) an amnesic group. Each group is considered in turn with numerous exemplary cases adequately investigated. A short chapter is given over to a study of aphasia in cases with an expanding brain lesion. Separate chapters are devoted to the study of the 22 cases of right cerebral lesion without aphasia compared with the specially selected normal control cases and also with apraxia and agnosia. Important chapters are devoted to a study of the course of the aphasic disorders, re-education, and the psychological changes in aphasia. Three short chapters summarize the authors' opinions upon the question of localization from the present series, the concepts of aphasia, apraxia and agnosia, with a general conclusion. A bibliography of the more important contributions is given.

This is a conscientious and masterly research upon a carefully selected and well controlled series of cases and should be of value to all who are interested in the neurological and psychological aspect of aphasia.

Fracastor, Syphilis or the French Disease. A Poem in Latin Hexameters by Girolamo Fracastoro. Translated by Heneage Wynne-Finch, M.A., and an introduction by J. J. Abraham, C.B.E., D.S.O., M.A., M.D. (Dub.), F.R.C.S. 253 pages, illustrated. Price 10/6 net. William Heinemann, London; Macmillan, Toronto, 1935.

That physicians and scholars are interested in Fracastorius and his poem *Syphilis sive Morbus Gallicus* is evidenced in the fact that there are ninety known editions of the poem separately published, in anthologies and in editions of Fracastor's collected works. Written in Latin and published in Verona in 1531, the first Italian translation appeared 200 years later, but in the meantime there were five editions in English, the first in 1686. French, German, Spanish and Portuguese translations have also been published.

There had been two descriptive poems preceding Fracastor's, the better known being the Spanish of Francisco Lopez de Villalobos published in Salamanca in 1498. In the first and second books of the poem Fracastor describes the disease, its epidemic form, and its treatment with mercury and guaiacum. The third book tells the story of the shepherd Syphilus who was struck down by the disease syphilis as a punishment for neglecting the worship of Apollo. The poem has received high praise from both his contemporaries and from modern students of Latin verse for its beauty of

diction, its singular felicity of style, the Virgilian rhythm and cadence, and the admirable use and variation of the caesura, while in humour Fracastor far excels Virgil.

The present translator has endeavoured to render Fracastor's meaning accurately and at the same time preserve the elegance and poetic charm of the poem in his flowing prose. The Latin and English appear on opposite pages, allowing the student constant reference to the original. One of the valuable features of the appendix to Book iii is the discussion of the origin of the name Syphilus chosen for the shepherd of the poem. Another is the extended reference to the subject of syphilis in Fracastor's *De Contagione*. This is an excellent clinical description of the disease and its treatment at the time, and includes Fracastor's discussion of the still unsettled question as to the American origin of the disease.

Dr. Abraham in his introduction, which is both historical and biographical, expresses the opinion that the name and reputation of Fracastor have survived because he invented the word "syphilis", "and his memory would now have been almost forgotten had he not played an active part in the early history of the disease to which he gave its permanent name". But the translator does not agree with this, for he says "the author's fame is far from being based on this work alone" which would seem to be the general opinion of writers of medical history today. Fracastor was an astronomer, geographer, mathematician, and botanist, as well as a poet and physician. He wrote the first description of typhus fever, propounded the theory of infective particles in epidemic disease, was ahead of his time in geology, suggested rectilinear maps twenty years before Mercator published his, did much to improve the charts used by early navigators, and used double lenses for astronomical study before Galileo.

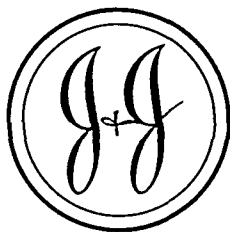
Mentality and the Criminal Law. O. C. M. Davis, M.D., D.Sc., Head of Department of Forensic Medicine, University of Bristol, and of the Middle Temple, Barrister-at-Law, and F. A. Wilshire, of the Middle Temple, Barrister-at-Law. 168 pages. Price \$1.50. John Wright & Sons, Bristol, Macmillan, Toronto, 1935.

In the words of the introduction, "The object of this small book is to present in as concise a manner as possible the salient points connected with the law of England regarding the commission of criminal offences by mentally disordered persons." It is a book directed perhaps to the lawyer, and particularly the English lawyer, rather than to the medical practitioner. The authors, not attempting a criminological study, have not considered those sociological aspects of the problem that have been receiving increasing attention of recent years. They have limited themselves to presenting the law of England as it relates at this moment to such topics as "Mind", "Insanity", "Mens Rea and Intent", "Drunkenness", "Irresistible Impulse", "Insanity from the Legal Point of View" and so on. Within these limits the book is clear, neat and well done. As setting forth the legal aspects of the problems raised by such topics, it should be of value to the medical man who is called upon to give evidence on any one of them in court.

BOOKS RECEIVED

Growing Superior Children. I. N. Kugelmass, M.D., Ph.D., Sc.D., Attending Paediatrician, Broach Street Hospital, French Hospital, and Heckscher Institute, New York. 568 pages, illustrated. Price \$3.50. Appleton-Century, New York and London, 1935.

School Education in Hygiene and Sex. G. O. Barber, M.B., Medical Officer, Felsted School. 71 pages. Price 2/6 net. W. Heffer & Sons, Cambridge, 1936.



THE MODERN PLASTER OF PARIS BANDAGE

THE SPECIALIST

**HARD COATED FROM END TO END
ABSOLUTELY NO LOOSE PLASTER**

WHEN you use "The Specialist" bandage you have the convenience of 3-second immersion, absence of loose plaster, and economy. "The Specialist" is economical because fewer bandages are required for casts or molded splints, also, the bandages can be saturated so quickly that you eliminate the necessity of having several bandages soaking at one time, with the possibility that all will not be used. "The Specialist" is made of surgical crinoline covered with a hard, smooth



surface of Plaster of Paris. Supplied in 3", 4", 5" and 6" widths. Setting time, approximately 10 minutes.

Johnson & Johnson Limited
MONTREAL CANADA

WORLD'S LARGEST MAKERS OF SURGICAL DRESSINGS

JOHNSON & JOHNSON LIMITED,
2155 Pius IX Blvd., Montreal, P.Q.

Please send me a sample of your "Specialist" Plaster of Paris Bandage for testing.

Name M.D.

Address

- Brain Preparations.** J. Wilh. Hultkrantz. Tr. from first German edition by H. J. Wilkinson, Professor of Anatomy, University of Adelaide, Australia. 48 pages. Price \$3.00. William Heinemann, London, 1935.
- The Patient and the Weather.** Vol. 1, Part 1. The Footprint of Asclepius. William F. Petersen, M.D. 127 pages. Price \$3.75. Edwards Bros., Ann Arbor, 1935.
- Common Skin Diseases.** A. C. Roxburgh, M.A., M.D., B.Ch., F.R.C.P., Physician in Charge of Skin Department, St. Bartholomew's Hospital. Third edition, 377 pages, illustrated. Price 15s. net. H. K. Lewis, London, 1935.
- The Osteopathic Lesion.** George Macdonald, M.B., Ch.B., D.O., and W. Hargrave-Wilson, D.O. 141 pages. Price \$2.25. Wm. Heinemann, London; Macmillan Co., Toronto, 1935.
- Tumours of the Female Pelvic Organs.** J. V. Meigs, A.B., M.D., F.A.C.S., Instructor in Surgery, Harvard Medical School. 533 pages, illustrated. Price \$7.20. Macmillan Co., New York, 1934.
- New Pathways for Children with Cerebral Palsy.** Gladys G. Rogers, Director of Robin Hood's Barn, and L. C. Thomas, Director of Therapeutics, Robin Hood's Barn, Ascutney, Vt. 167 pages. Price \$3.00. Macmillan Co., New York, 1935.
- Applications Pratiques de la Transfusion Sanguine.** R. Moline, interne des hôpitaux de Paris. 60 pages. Price 10Fr. J.-B. Baillière et Fils, Paris, 1936.
- Transactions of the American Association of Genito-Urinary Surgeons.** Vol. 28. 428 pages, illustrated. Bruce Publishing Co., Saint Paul and Minneapolis, 1935.
- Kolloid-Fibel für Mediziner.** Raphael Ed. Liesegang, Institut für Physikalische, Grundlagen der Medizin, Frankfurt. 33 pages. Price RM 1. Theodor Steinkopff, Dresden and Leipzig, 1936.
- Endokrine Krankheiten.** Vol I, Medizinische Praxis Series. Hans Curschmann, Universitätsprofessor, Rostock. 144 pages. Price RM8. Theodor Steinkopff, Dresden and Leipzig, 1936.
- The Hospital Yearbook.** 14th edition, 505 pages. Price \$2.50. Modern Hospital Publishing Co., Chicago, 1935.
- The Brain as an Organ.** Frederic Wertham, M.D. and Florence Wertham. 538 pages, 168 plates. Price \$9.00. Macmillan Co., New York, and Toronto, 1934.
- The Tuberculin Handbook.** H. Sutherland, M.D., Hon. Physician to Queen Alexandra Sanatorium Fund. 98 pages. Price \$2.50. Oxford University Press, London; McAinsh, Toronto, 1936.
- Zweite Internationale Kropfkongferenz,** Berne, August 10-12, 1933. Dr. Otto Stiner. 698 pages, illustrated. Price, Swiss Fr. 25. Hans Huber, Bern, 1935.
- International Clinics.** By various authors. Vol. 1, forty-sixth series. 314 pages, illustrated. Price \$3.00. J. B. Lippincott, Philadelphia, Montreal & London, 1936.
- You Must Eat Meat.** Max E. Jutte, M.D. 164 pages. Price \$2.00. G. P. Putnam's Sons, New York, 1936.
- Textbook of Medicine for Nurses.** E. Noble Chamberlain, M.D., M.Sc., M.R.C.P., Assistant Physician, Royal Infirmary, Liverpool. Second edition, 444 pp., illustrated. Price \$3.25. Oxford University Press, London; McAinsh & Co., Toronto, 1935.
- Injury and Incapacity.** H. E. Griffiths, M.D., F.R.C.S., Surgeon, Albert Dock Hospital. 270 pages. Price \$3.75. Baillière, Tindall & Cox, London; Macmillan Co., Toronto, 1935.
- The Single Woman and Her Emotional Problems.** Laura Hutton, B.A., M.R.C.S., L.R.C.P., Physician, Institute of Medical Psychology. 151 pages. Price \$1.75. Baillière, Tindall & Cox, London; Macmillan, Toronto, 1935.
- Examination of the Patient and Symptomatic Diagnosis.** J. W. Murray, M.D. Second edition, 1219 pages, illustrated. Price \$11.00. C. V. Mosby, St. Louis; McAinsh, Toronto, 1936.
- Reminiscences.** Agnes Hunt, D.B.E., R.R.C. 137 pages, illustrated. Price 5s. Wilding & Son, Shrewsbury, 1935.
- A Short Ante-Natal and Post-Natal Handbook.** R. K. Ford, M.D., M.M.S.A., St. Olave's Hospital, Rotherhithe. 141 pages. Price \$1.80. Oxford University Press, London; McAinsh, Toronto, 1935.
- Bacteriology in Relation to Clinical Medicine.** M. N. De, M.B., M.R.C.P., Professor of Pathology, Medical College of Bengal, Calcutta, and K. D. Chatterjee, M.B., Medical Registrar, Medical College Hospitals, Calcutta. 599 pages, illustrated. Price 30s. net. Copies may be obtained from the authors.
- British Health Resorts.** Official handbook of British health resorts association. Edited by R. F. Fox, M.D., F.R.C.P., F.R.Met.S. 288 pages. Price 1s. net. J. & A. Churchill, London, 1936.
- Time of Ovulation in Women.** C. G. Hartman, Department of Embryology, Carnegie Institution of Washington. 226 pages, illustrated. Price \$3.00. Williams & Wilkins, Baltimore, 1936.
- Synopsis of Surgical Anatomy.** A. L. McGregor, M.Ch., F.R.C.S., Lecturer on Surgical Anatomy, University of Witwatersrand. Third edition, 664 pages, illustrated. Price \$5.25. John Wright & Sons, Bristol; Macmillan Co., Toronto, 1936.
- Diseases of Nose, Throat and Ear.** Fourth edition edited by A. L. Turner, M.D., LL.D., F.R.C.S.E., Consulting Surgeon, Ear & Throat Department, Royal Infirmary, Edinburgh. 473 pages, illustrated. Price \$6.00. John Wright & Sons, Bristol; Macmillan Co., Toronto, 1936.
- Ideal Birth.** Th. H. van de Velde, M.D. 296 pages. Price \$3.00. Wm. Heinemann, London, 1935.
- The Hygiene of the Change in Women.** Isabel M. Hutton, M.D. 110 pages. Price \$1.50. Wm. Heinemann, London; Macmillan, Toronto, 1936.
- The Medical Annual, 1936.** 621 pages, illustrated. Price \$6.00. John Wright & Sons, Bristol; Macmillan, Toronto, 1936.
- Synopsis of Diseases of Heart and Arteries.** George R. Herrmann, M.D., Ph.D., Professor of Clinical Medicine, University of Texas. 344 pages, illustrated. Price \$4.50. C. V. Mosby, St. Louis; McAinsh & Co., Toronto, 1936.

SERENIUM



**. . shortens the duration of
genito-urinary infections**

THE ORAL ADMINISTRATION of Serenium in therapeutic doses produces a marked bacteriostatic effect on micro-organisms which are present in the urine. Thus it is very useful as an adjunct in the treatment of certain genito-urinary infections. It often gives excellent results in the treatment of pyelitis and cystitis in children. In gonorrhea it reduces the discharge—alleviates the symptoms and shortens the duration of the infection when used in conjunction with the usual local treatment.

Serenium is a distinct chemical compound, an organic dye, the hydrochloride of 2-4 diamino 4' ethoxy-azobenzene. While bacteriostatically effective, it is so free from toxic effects that it can practically be considered innocuous. Serenium imparts a reddish orange color to acid urines, a fact which often inspires confidence in the patient that a cure is being effected.

Serenium is supplied exclusively by E. R. Squibb & Sons. It is supplied in bottles of 25, 50 and 500 chocolate-coated tablets of 0.1 gram each. The usual dose is one tablet three times a day after meals.

*For literature write Professional Service Department,
36 Caledonia Road, Toronto, Ont.*

E·R·SQUIBB & SONS OF CANADA, Ltd.
MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858

★ CYSTITIS

Prompt symptomatic relief

Prompt relief of the distressing symptoms which often accompany cystitis may be obtained by the oral administration of Pyridium. Shortening of the duration of treatment has been reported in many cases. Pyridium is non-toxic and non-irritative in therapeutic doses. The use of Pyridium Solution for irrigation or topical application may be effectively combined with the oral administration of the tablets.



TRADE **PYRIDIUM** MARK

Phenylazo - Alpha - Alpha - Diamino - Pyridine Mono - Hydrochloride

A Series of
IMPROVED ANTITOXINS

GLOBULIN **Lederle** MODIFIED

DIPHTHERIA . . . SCARLET FEVER
 ERYSIPELAS . . . STAPHYLOCOCCUS
 GAS GANGRENE . . . TETANUS

- 40% less bulk!
- lower viscosity!
- more of the troublesome proteins discarded and the remainder modified
 AND HENCE
- fewer reactions!

Now being supplied on all orders

This REDUCTION IN BULK of our new Globulin Modified Antitoxins is fairly typified in the illustration of the Tetanus syringes.

Reduction of serum sickness follows, as is to be expected from the reduced bulk and the lessened amount of troublesome and useless proteins.

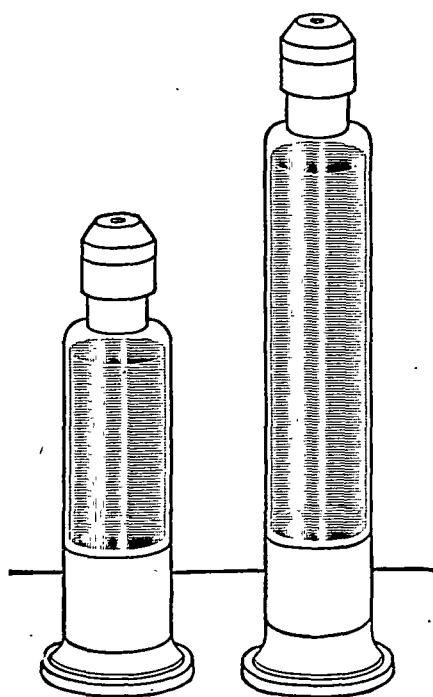
The modification of the globulins, it is believed, further contributes toward reduced liability to elicit serum sickness.

Send for circular

LEDERLE LABORATORIES, INC.
 1396 St. Catherine Street, West Montreal, Quebec

FISHER & BURPE, Depot
 219 Kennedy Street
 Winnipeg, Manitoba

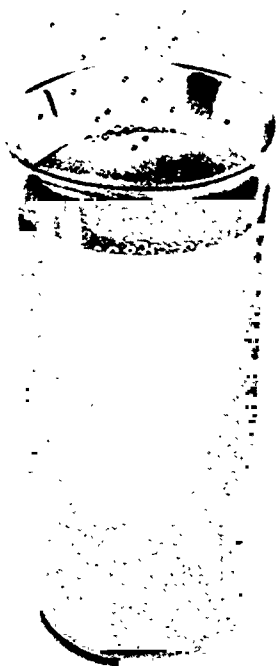
W. LLOYD WOOD, Ltd.
 64-66 Gerrard Street
 Toronto, Ontario, Canada



NEW OLD

Actual Size—10,000 Unit Dose

TETANUS ANTITOXIN



ACIDOSIS

— IT NEED NOT BE

Acidosis is a frequent complication of febrile disease and of metabolic disorders. It tends to aggravate the disease, it probably prolongs it, eases the way to complications and sequelae, and retards convalescence. The untoward influences of acidosis can be curbed by

supporting the alkali reserve with Alka-Zane. Alka-Zane supplies the four principal bases of which the reserve is composed: sodium, potassium, calcium and magnesium. The carbonates, citrates and phosphates of these elements are combined in a pleasant-tasting, effervescent salt that makes a zestful, refreshing drink in water.

Alka-Zane is supplied in bottles of 4 ounces. Trial supply gladly sent on request. William R. Warner & Co., Ltd., 727 King Street, West, Toronto, Ontario.

ALKA ZANE



SCIENTIFICALLY PREPARED to preserve minerals and Vitamins



THE NUTRITIVE VALUE OF HEINZ STRAINED VEGETABLES								
	Spinach	Carrots	Peas	Green Beans	Vegetable Soup	Beets	Tomatoes	Prunes
ANALYSIS								
Total Solids	6.3	8.5	15.7	7.5	11.7	10.5	12.0	31.0
Protein (N x 6.25)	2.2	1.0	4.8	2.2	1.8	1.5	2.1	1.1
Fat	0.5	0.2	0.5	0.2	0.1	0.1	0.2	0.2
Total Carbohydrates	1.5	5.7	8.8	3.8	8.7	7.5	8.2	28.2
Total Sugars	none	4.9	2.9	2.6	1.9	5.2	7.3	21.1
Crude Fiber	0.7	0.8	1.0	0.8	0.4	0.6	0.4	0.8
Ash	1.4	0.8	0.6	0.5	0.7	0.8	1.1	0.7
Calcium	0.057	0.029	0.012	0.052	0.026	0.017	0.013	0.033
Phosphorus	.039	.029	.083	.031	.025	.037	.030	.032
Iron	0.001	0.001	0.0016	0.001	0.0010	0.0016	0.0016	0.0018
ENERGY VALUE								
Calories per ounce	5.4	8.0	17.0	7.2	12.2	10.4	11.6	28.0
Calories per 100 grams	19	28	59	25	43	40	41	93
VITAMIN CONTENT								
Vitamin A	very good	very good	good	good	very good	fair	very good	good
Vitamin B	good	good	very good	fair	good	fair	very good	fair
Vitamin C	good	fair	very good	fair	good	poor	excellent	poor
Vitamin G	good	fair	fair	good	good	fair	good	very good

HEINZ Strained Foods.... for Babies

Only the finest and freshest products selected by trained inspectors go into Heinz Strained Vegetables. In a matter of hours after picking or gathering they are being prepared in Heinz kitchens by the most approved hygienic and scientific methods.

In Heinz processing, air is excluded all through the cooking, straining and packing. Such methods would, of course, be impossible in preparing foods at home. Yet they are vital if minerals and vitamins, precious to health, are to be retained.

Heinz Strained Vegetables not only save mothers tedious hours in preparing their babies' food, but provide that food with an assured nutrient content, in all seasons of the year.

Many doctors are recommending Heinz

Strained Vegetables in cases of Tonsillectomy for children or adults.

Samples for Doctors

The H. J. Heinz Company would like you, as a doctor, to know the special care exercised in the preparation of these strained foods. Will you accept, please, free of cost or obligation, an assortment of any six varieties? Merely write for them on your professional stationery, to H. J. Heinz Co., Toronto, Ontario. Varieties available are Strained Tomatoes, Strained Beans, Strained Prunes, Strained Carrots, Strained Vegetable Soup, Strained Beets, Strained Peas, Strained Spinach and Strained Cereal.

Good dealers throughout Canada now sell Heinz Strained Foods, prices are moderate. Prepared in our Canadian plant at Leamington.

Dry Cough or Congestive?

Expectorants are of special utility when they give the physician a latitude of choice.

Creo-Terpin Comp. is a "stimulant" expectorant combining creosote and terpin hydrate in fluid form for relief of excessive respiratory secretion.

Bronchoids are a "stimulant" expectorant in capsules, embodying creosote, terebene and eucalyptol for relief of congestive cough.

Sanguinaria Comp. combines "emetic" expectorants for promotion of secretion and relief of dry cough.

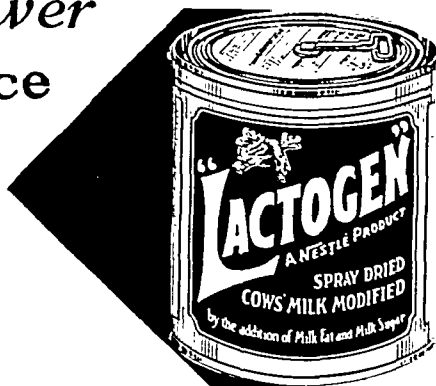
Samples for clinical trial free to physicians

HENRY K. WAMPOLE & CO. LTD.

Manufacturing Pharmacists

PERTH, ONTARIO, CANADA

To enable your
patients to obtain
LACTOGEN
at a *lower*
price



the
price of
the 1-lb. size
can of **LACTOGEN**
has been reduced
to our wholesale
trade by
16 $\frac{2}{3}$ %

NESTLÉ'S MILK PRODUCTS
(CANADA) LTD.
Metropolitan Building
TORONTO - CANADA

For Vaginitis due to Trichomonas

PICRATOL

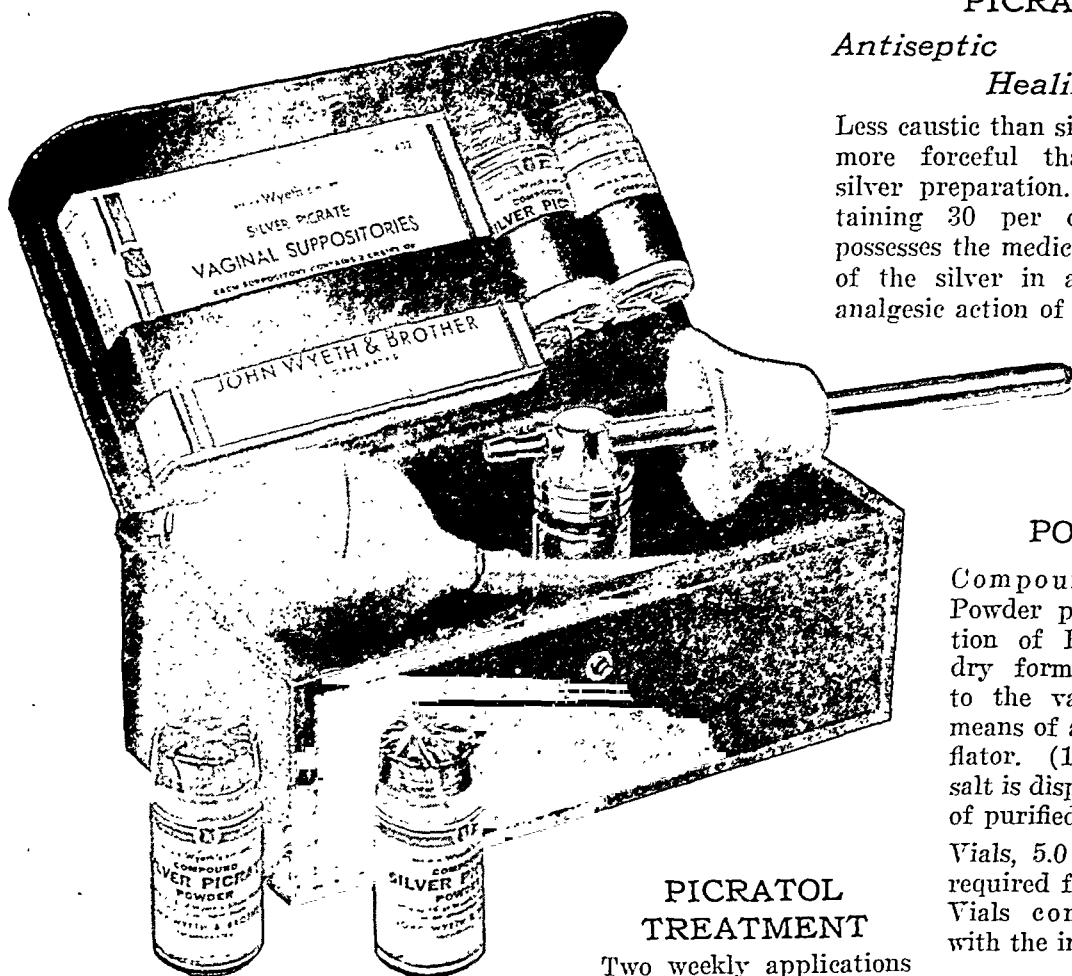
(Silver Picrate—Wyeth)

Effectively germicidal . . .
Yet non-irritating . . .

PICRATOL

Antiseptic Analgesic
Healing

Less caustic than silver nitrate but more forceful than a colloidal silver preparation. Picratol containing 30 per cent of silver, possesses the medicinal advantages of the silver in addition to the analgesic action of picric acid.



POWDER

Compound Picratol Powder permits application of Picratol in the dry form as a coating to the vaginal wall by means of a vaginal insufflator. (1% of the silver salt is dispersed on a base of purified kaolin.)

Vials, 5.0 Gm.; one vial required for a treatment. Vials connect directly with the insufflator.

PICRATOL TREATMENT

Two weekly applications of the Powder and, subsequent to each treatment, one Picratol Vaginal Suppository inserted at bedtime.

VAGINAL SUPPOSITORIES

Picratol is compounded with boroglyceride and gelatin for control of infections in the female genital tract.

Wyeth's PICRATOL KIT

Completely equipped containing:

- 4 vials, 5.0 Gm., Picratol Powder
- 2 boxes 12 each Vaginal Suppositories, 2 gr.
- 1 Shelanski-Pilling Insufflator.

JOHN WYETH & BROTHER

- -

WALKERVILLE, ONT.

Nupercainal "Ciba"

An Ointment with local anaesthetic action

There is just enough Nupercaine in Nupercainal "Ciba" to bring prompt and prolonged analgesic relief in distressing skin conditions. Irritation is soothed and pain subsides; thus earlier healing is prompted.

Nupercainal "Ciba" enjoys wide professional acceptance as an application to hæmorrhoids, burns, sunburn, bed-sores, and in pruritus ani and vulvae, etc.

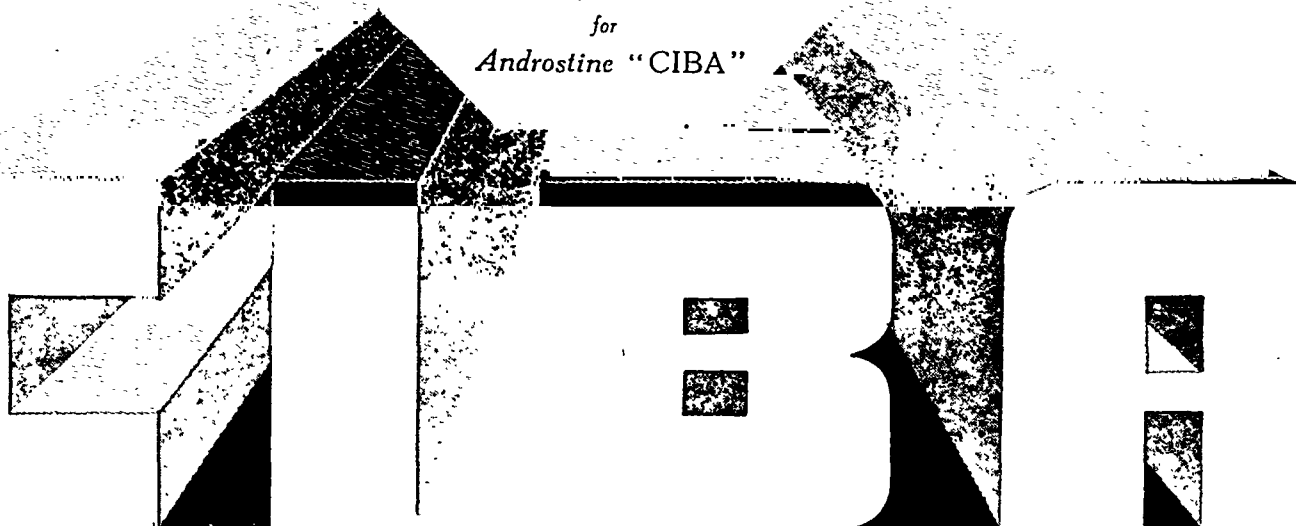


For Dispensing:
in tubes of
1 oz.

For Hospital Use:
in jars of
1 lb.

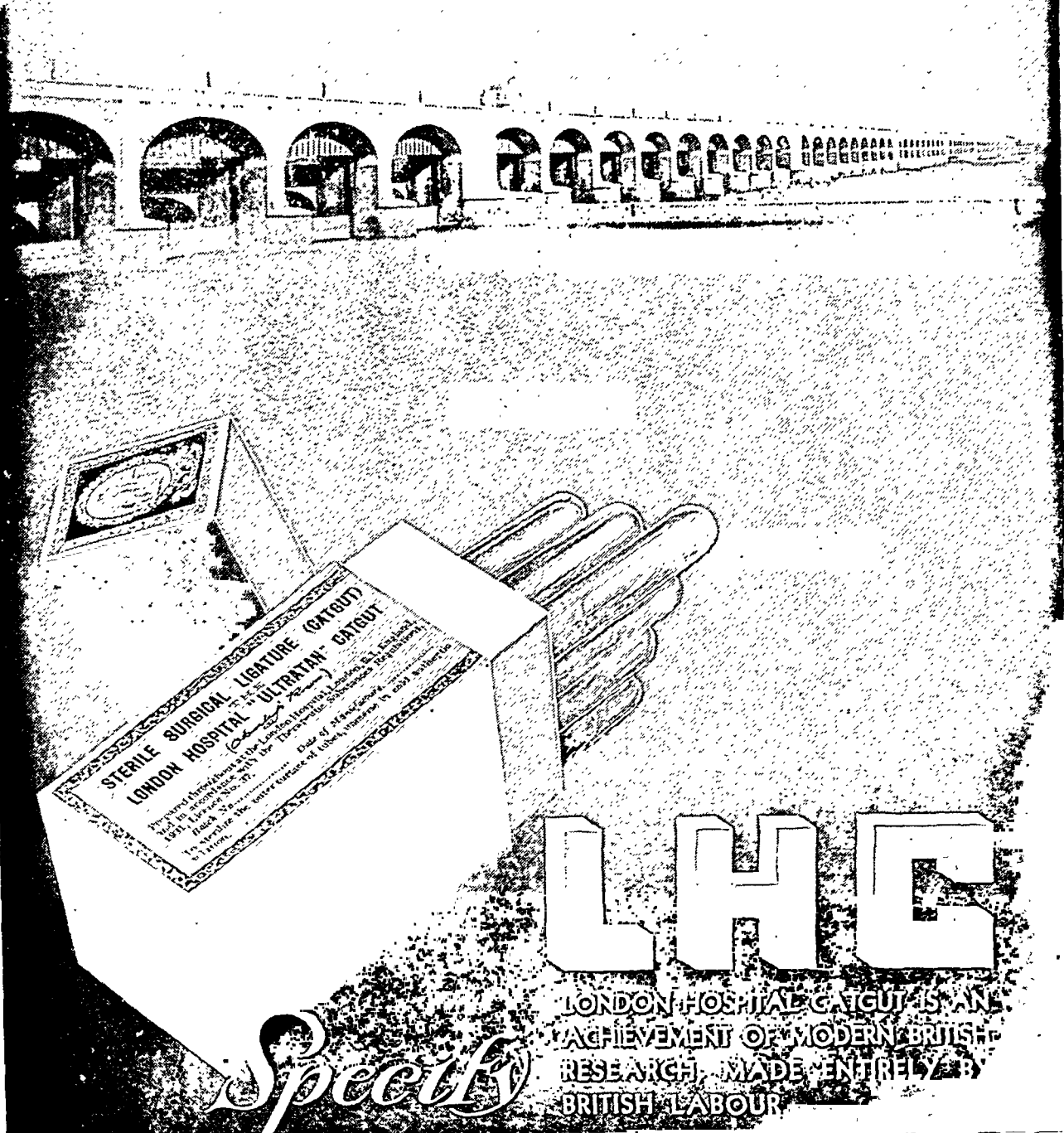
CIBA
COMPANY
Limited
MONTREAL

*Sole Representatives
for
Androstine "CIBA"*



MODERN ACHIEVEMENT

Lloyd Barrage, Sukkur, Bombay Presidency, the largest water conservation scheme in the world, irrigates an area of 2,500,000 acres. A marvel of modern achievement.



LHC

LONDON HOSPITAL GASTRITIS AN
ACHIEVEMENT OF MODERN BRITISH
RESEARCH, MADE ENTIRELY BY
BRITISH LABOUR

LONDON HOSPITAL CATGUT

Obtainable from

MESSRS. DOWN BROS. LTD., AGENTS FOR CANADA

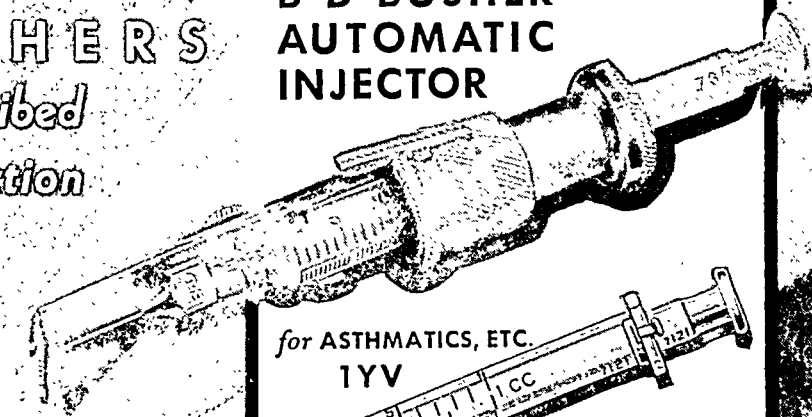
Telegrams : Downbro, Toronto.

143 College Street, Toronto.

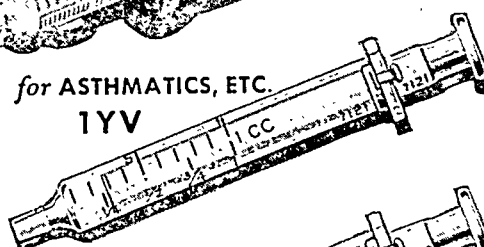
Telephone: Waverley 9245

for
**DIABETICS
 ASTHMATICS
 AND OTHERS**
 on prescribed
 self-injection

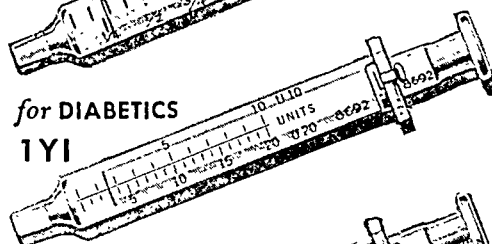
B-D BUSER AUTOMATIC INJECTOR



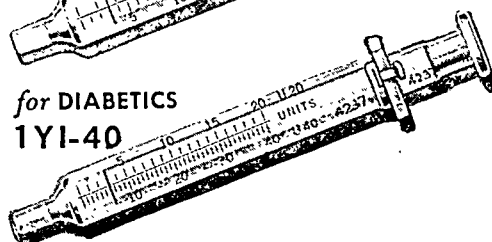
for ASTHMATICS, ETC.
 1YV



for DIABETICS
 1YI



for DIABETICS
 1YI-40



B-D PRODUCTS
Made for the Profession

THE Buser Injector affords practically painless injection at the right depth and angle. The user sets the injector, trips the trigger and injects.

The 1YV B-D Yale Syringe facilitates accurate small dosage of vaccines and other medication. It fits the Buser. For insulin users, the two short type B-D insulin syringes are desirable.

B-D needles in two's, in small sizes, are available on metal cards wrapped in a transparent envelope. Just name the B-D brand of needles required and specify 'Twin Pak'.

These B-D Syringes fit the Buser Injector

No. 1YV. Capacity 1 cc. A new syringe designed for use with vaccines and other medications where exact dosage in small quantities is essential. It is graduated in 1/10 cc. and 1/4 cc.

No. 1YI. Capacity 1 cc. Scale is for 10 or 20 unit insulin dosage.

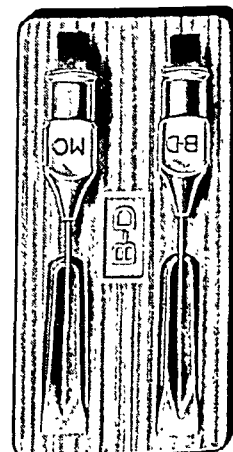
No. 1YI-40. Scale is graduated for 20-40 insulin dosage.

NOTE: Either of the insulin syringes may be secured with a blue glass plunger

TWIN-PAK

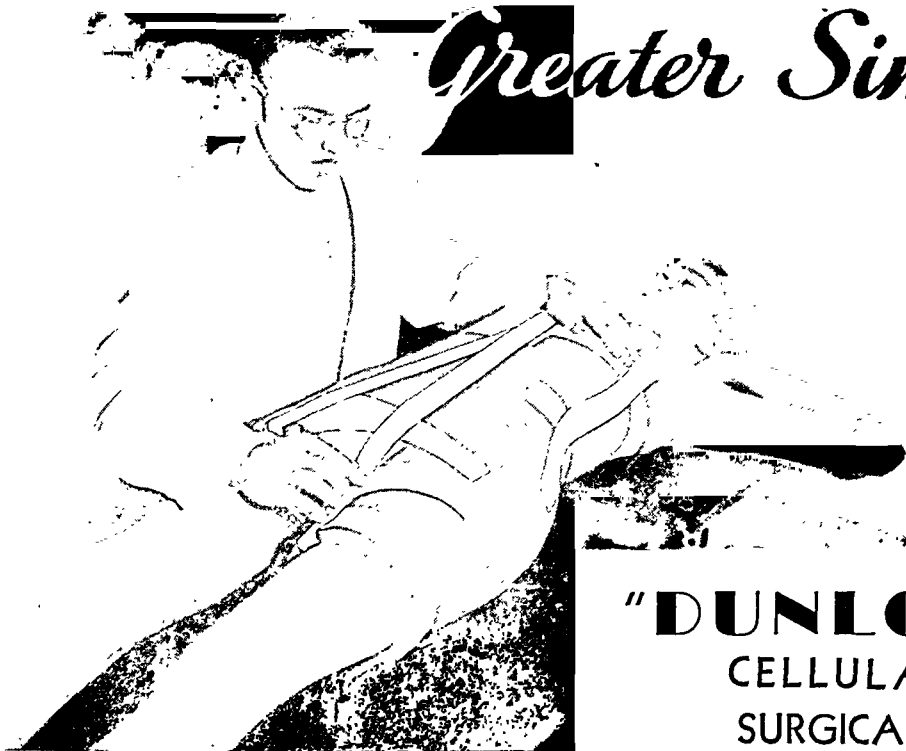
B-D Needles in Two's on Metal Card

B-D Needles are available on this rigid metal card which protects the cannulae and points. Furnished at no extra cost with B-D Needles, up to and including 1/2" size. Packaged six cards or one dozen needles to the box.



BECTON, DICKINSON & CO., RUTHERFORD, N. J.

MORE COMFORT FOR PATIENT Combined with *Greater Simplicity*



Can be fitted with adhesive as shown above or held with towel clips while cast bandaging is applied

"DUNLOPILLO" CELLULAR LATEX SURGICAL SHEETS For PLASTER CAST PADDING

Soft, resilient and easily applied, "DUNLOPILLO" Cast Padding Material will not wrinkle under the cast.

Cellular construction allows free air circulation, dispelling discomfort from heat and moisture and overcoming causes of body pressure sores. Insulating qualities prevent condensation between body and cast. Gives patient greater ease, relaxation and comfort, thus contributing greatly to early convalescence.

"DUNLOPILLO" Cast Padding Material may be purchased from the following medical supply houses:—

J. F. Hartz Co., Ltd. - - - Toronto and Branches
Ingram & Bell, Ltd. - - - Toronto and Branches
J. Stevens & Sons Co. - - - Toronto and Branches
Fisher & Burpe Co., Ltd., Winnipeg and Branches

The Standard Tube Co., Ltd. - Woodstock, Ont.
The Metal Craft Co., Ltd. - - - - Grimsby, Ont.
Surgical Supplies of Canada, Ltd., Toronto, Ont.
Casgrain & Charbonneau - - - - Montreal, Que.

"DUNLOPILLO" MATTRESSES. More than 100 hospitals and nursing homes in Canada, U. S. A. and England have found that "DUNLOPILLO" Mattresses not only promote refreshing sleep, relaxation and comfort, but are permanently resilient and non-puncturable, light and easy to handle and never need shaking up. Especially beneficial in cases of Insomnia, Rheumatism, Rheumatoid Arthritis, Asthma and Hay Fever.

"DUNLOPILLO" Operating Table Pads have comfortable resiliency which induces relaxation, at the same time providing proper firmness for operating. Definitely germ-resisting and by nature slightly antiseptic.

"DUNLOPILLO" Horse Shoe Cushions greatly assist in overcoming bed sore causes.

"DUNLOPILLO" Ring Cushions are ideal for Invalids and Elderly Persons.

"DUNLOPILLO" Cushioning is "whipped up" from milky liquid latex, the cellular construction and complete porosity being the result of air bubbles being whisked into the liquid, and is possible only by this exclusive process.

DUNLOP TIRE & RUBBER GOODS CO., LIMITED

Head Office and Factories, Toronto—Branches in leading cities

LIBBY'S HOMOGENIZED FOODS INCLUDED IN REGULAR DIONNE QUINTUPLETS' DIET



Photograph Copyright, Star Newspaper Service

Homogenized Solid Foods yield *more nutriment*

AN exclusive diet of milk, in infant feeding, is deficient in iron and copper required to protect against nutritional anemia. It is agreed by leading doctors that the infant's milk diet must be supplemented early in life with foods which give these essential minerals.

Libby's Homogenized Foods are solving the problem of making solid foods easily digested by the infant, without danger of intestinal upsets. Laboratory and clinical evidence has demonstrated that Libby's special method of homogenizing vegetables, fruits, cereal and soup makes these foods far easier to digest than strained foods. It also makes them yield far more nutriment. Homogenization completely breaks up the cellulose wall that surrounds food cells and renders the nutriment quickly available for easy assimilation.

Feeding tests show that Libby's Homogenized Foods may be safely fed many babies at as early an age as three months without feeding disturbances.

Libby's Homogenized Foods are available in a complete solid food diet in six tins. They comprise three vegetable combinations, a cereal combination, a fruit combination and a soup: a plan which ensures variety and balance in the diet.

Pediatricians and physicians are invited to write Libby, McNeill & Libby Laboratories, Chatham, Ontario, for a series of bulletins which summarize the research on infant feeding that Libby has conducted. Also for samples of Libby's complete line of Homogenized Foods.

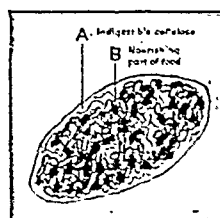
LIBBY, McNEILL & LIBBY OF CANADA LIMITED
CHATHAM . . . **ONTARIO**

Libby's
Made in Canada

Homogenized
FOODS FOR BABIES

UNSEASONED EXCEPT FOR SALT • PACKED IN ENAMEL-LINED TINS

HOMOGENIZED FOODS ARE EASIER TO DIGEST THAN STRAINED FOODS



BEFORE, Nourishment is walled in by tough cellulose barrier. The cell walls are not completely broken down by careful straining of foods. Needed nourishment is lost. Undigested food passes into large intestine where it may ferment and cause serious disturbances.



AFTER, Food cells after homogenization by Libby's special process. Tough cellulose wall (A) has been completely broken down. Nourishment (B) has been released for quick digestion. The infant's delicate intestinal tract can digest these particles easily and completely. Baby gets more nourishment from same amount of food.

Libby's Baby Foods in 6 balanced combinations:

- 1 Peas, beets, asparagus tips
- 2 String beans, pumpkin, tomatoes
- 3 Carrots, spinach, peas
- 4 Cereal Combination . . . whole milk, whole wheat, soy bean flour
- 5 Prunes, pineapple juice, lemon juice
- 6 Soup—vegetables, chicken livers, barley



What Can I Do With Such a Small X-Ray Unit?



● The question is natural when you first see the General Electric Model "F" Office Portable X-Ray Unit.

To answer specifically, this unit will produce radiographs of the average size patient as follows: The chest, at 32" focal-film distance, in $\frac{3}{4}$ second; lateral skull at 20" in $3\frac{1}{2}$ seconds; the pelvis at 25" in 6 seconds.

As to the quality of these radiographs, we prefer that you be the judge. Simply arrange for a demonstration of the Model "F" in your office, at your convenience, and positively without obligation. The majority of present users of the Model "F" were convinced by actual demonstration.

Shock proof operation, compactness, portability, flexibility, concentrated power and practical diagnostic range—these are features you will appreciate in the Model "F", all made possible by oil immersion of the entire high voltage system.

Fill out and mail this coupon today.

Distributors: VICTOR X-RAY CORPORATION OF CANADA, LTD., Montreal, Toronto, Winnipeg, Vancouver

A66

GENERAL ELECTRIC X-RAY CORPORATION
2012 Jackson Boulevard, Chicago, Illinois

Please have your representative arrange for a demonstration of the Model "F" X-Ray Unit in my office.

Name

Address

City.....State.....

**GENERAL  ELECTRIC
X-RAY CORPORATION**

The Canadian Medical Protective Association

PRESIDENT - JOHN F. ARGUE, M.D.

A mutual medical defence union founded in 1901 at the Winnipeg meeting of the Canadian Medical Association, incorporated by act of Dominion Parliament February 1913, and affiliated with the Canadian Medical Association 1924.

OBJECTS: To assist in the defence of its members in cases of alleged malpractice, and to encourage honourable practice in the daily work of the medical profession. The annual fee is five dollars per calendar year, half-rates after July first.

Subject to our by-laws, assistance is given by the payment of the taxable costs of actions together with reasonable counsel and witness fees in cases undertaken by our Association, as well as damages if awarded. All members in good standing of the Canadian and various Provincial Medical Associations may be enrolled upon signing the application form and paying the annual fee. All other regularly qualified practitioners must have their application countersigned by two members of our Association. Blank application forms and other literature upon request.

ADDRESS ALL CORRESPONDENCE TO THE SECRETARY-TREASURER

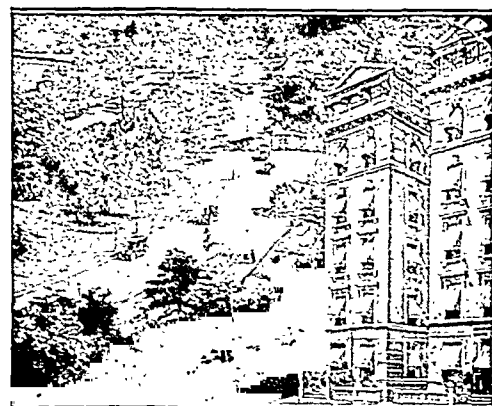
SUITE 401 - 180 METCALFE STREET, OTTAWA, CANADA

CHARLES B. TOWNS HOSPITAL

293 Central Park West

New York, New York

For **ALCOHOLISM** and **DRUG ADDICTION**



Located Directly
Across from Central Park

ANY
PHYSICIAN
having an
addict prob-
lem is invited
to write for
Hospital lit-
erature.

This institution has specialized in addictions for over 30 years. Its method of treatment has been fully described in THE JOURNAL A. M. A.; in The Handbook of Therapy, from the A. M. A. Press; and in other scientific literature. The treatment is a regular hospital procedure, and provides a definite means for eliminating the toxic products of alcohol and drugs from the tissues. A complete Department of Physical Therapy, with gymnasium and other facilities for physical rebuilding, is maintained. Operated as an "open" institution. Physicians are not only invited but urged to accompany and stay with their patients.

THE NEW YORK POLYCLINIC MEDICAL SCHOOL AND HOSPITAL

(ORGANIZED 1881)

(The Pioneer Post-Graduate Medical Institution in America.)

FOR THE GENERAL SURGEON

A combined surgical course comprising General Surgery, Traumatic Surgery, Abdominal Surgery, Gastro-Enterology, Proctology, Gynecological Surgery, Urological Surgery, Thoracic Surgery, Pathology, Roentgenology, Physical Therapy, Operative Surgery and Operative Gynecology on the Cadaver.

UROLOGY

Surgical Anatomy
Urologic Operations
Diagnosis and Office
Treatment
Regional Anesthesia
Proctology
Neurology
Cystoscopy and
Endoscopy
Dermatology and
Syphilology
Diathermy
Pathology
Roentgenology
Operative Urology (cadaver)

Proctology, Gastro-Enterology and ALLIED SUBJECTS

ANESTHESIA

Regional and spinal (cadaver), with demonstrations in the clinics of caudal, spinal, nerve and field block, covering surgery in Urology, Gynecology and General Surgery. Anesthesia in general, with lectures and demonstrations.

FOR INFORMATION ADDRESS

MEDICAL EXECUTIVE OFFICER, 345 West 50th St., New York City

Columbia University New York Post-Graduate

Medical School

GYNECOLOGY

Beginning October 1, 1936

Under the direction of Dr. Walter T. Dannreuther

Seminar—one to three months. Approximates 31 hours a week, including clinical gynecology, diagnosis and office treatment, lectures in gynecology, demonstration of operative procedures, cystoscopy, endocrinology, gynecological pathology, follow-up clinics and ward rounds.

Operative cadaver surgery in gynecology (12 lessons) by arrangement.

Special courses in cystoscopy and endoscopy in the female, in endocrinology, and in diagnosis and office treatment, by arrangement.

For further information, address

The Director

311 East 20th Street, New York City

Cook County Graduate School of Medicine

(IN AFFILIATION WITH COOK COUNTY HOSPITAL)

Announces Continuous Courses

MEDICINE—Informal Course first of every week; Intensive Personal Courses August and September.

SURGERY—General Course One, Two, Three and Six Months; Intensive Course Surgical Technique every two weeks; Special Courses.

GYNECOLOGY—Three Months Course; Two Weeks Intensive Course; Four Weeks Intensive Personal Course starting August 17th.

OBSTETRICS—Informal Course; Special Courses.

FRACTURES AND TRAUMATIC SURGERY—Informal Practical Course; Intensive Ten Day Course starting July 13th.

PEDIATRICS—Informal Course; Personal Courses.

EAR, NOSE AND THROAT—Informal Course; Personal Courses; Intensive Two Weeks Course starting October 5th.

UROLOGY—General Course Two Months; Intensive Course Two Weeks; Special Courses.

CYSTOSCOPY—Intensive Course every two weeks (Attendance limited).

General, Intensive and Special Courses in Tuberculosis, Ophthalmology, Roentgenology, Dermatology and Syphilology, Pathology, Neurology, Electrocardiography, Topographical and Surgical Anatomy, Physical Therapy, Gastro-Enterology, Allergy, Rectal Diseases, Varicose Veins.

Teaching Faculty—Attending Staff of Cook County Hospital

Address: Registrar

427 South Honore Street, Chicago, Illinois

EDINBURGH POST-GRADUATE COURSES IN MEDICINE

IN CONNECTION WITH THE UNIVERSITY AND ROYAL COLLEGES, 1936

The POST-GRADUATE COURSES to be held this year comprise:

- (1) A COURSE IN OBSTETRICS AND GYNAECOLOGY from July 13th to August 1st. Fee: £8. 8s.
- (2) A GENERAL PRACTITIONERS' COURSE from August 17th to September 12th. Fee: £10. 10s. for whole course; £6. 6s. for two weeks.
- (3) A GENERAL SURGICAL COURSE from August 17th to September 12th. Fee: £10. 10s. for whole course; £6. 6s. for two weeks.

In addition to the above, Courses in the following Subjects will be held at various periods of the year: INTERPRETATION AND SIGNIFICANCE OF

MODERN DIAGNOSTIC METHODS. Fee: £4. 4s.

DISEASES OF THE BLOOD. Fee: £3. 3s.

ENDOCRINOLOGY. Fee: £3. 3s.

DISEASES OF THE NERVOUS SYSTEM. Fee: £3. 3s.

UROLOGY. Fee: £10. 10s.

X-RAY PHYSICS, AND ELECTRO-TECHNICS. Fee: £3. 3s.

ULTRA-VIOLET RADIATIONS AND THEIR USES. Fee: £3. 3s.

OPHTHALMOSCOPY. Fee: £5. 5s.

UROLOGICAL SURGERY AND TREATMENT OF FRACTURES. Fee: £3. 3s.

NEUROLOGICAL SURGERY. Fee: £2. 2s.

DISEASES OF NOSE, EAR, AND LARYNX (Royal Infirmary). Fee: £10. 10s.

DISEASES OF EAR, NOSE, AND THROAT (Ear and Throat Dispensary). Fee: £4. 4s.

OPERATIVE SURGERY OF THE EAR. Fee: £2. 2s.

VENEREAL DISEASES. Fee: £10. 10s.

SURGICAL PATHOLOGY. Fee: £4. 4s.

ORTHOPAEDIC SURGERY. Fee: £4. 4s.

CLINICAL MEDICINE, INCLUDING CHILD LIFE AND HEALTH. Fee: £3. 3s.

CLINICAL SURGERY. Fee: £4. 4s.

MODERN METHODS IN ANÆSTHESIA. Fee: £3. 3s.

The Courses will be held only if a sufficient number of entries are received.

Further particulars may be had on application to the Hon. Secretary, Post-Graduate Courses in Medicine, University New Buildings, Edinburgh.

WHY NOT GET THE F.R.C.S.?

Canadian and American Surgeons should send Coupon below for our valuable publication

"How to Pass the F.R.C.S."

Principal Contents.

The F.R.C.S. England, Primary and Final. The primary F.R.C.S. England examinations can now be taken in Canada. Examinations are held annually in October.

The F.R.C.S. Edinburgh, Ireland.

Diploma in Ophthalmology.

Diploma in Laryngology, Otology, etc.

Other Higher Surgical Qualifications.

You can prepare for any of these qualifications by taking our intensive postal courses of instruction at home and come to England when ready for the examination.

The F.R.C.S. of England or Edinburgh is within the reach of every Canadian or American Surgeon.

Let us help you to get it.

THE SECRETARY
MEDICAL
CORRESPONDENCE
COLLEGE

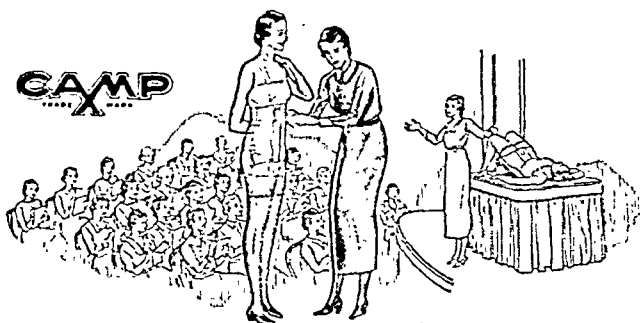
19 Welbeck Street,
London, W.1, England

Sir,—Please send me your booklet "How to Pass the F.R.C.S." also "Guide to Medical Examinations" by return.

Name

Address

C.M.A.



WHY CAMP SUPPORTS ARE ACCURATELY FITTED

It is no mere accident, or fortunate circumstance, that you are assured accurate fittings for those of your patients for whom you prescribe Camp supports. Camp Schools for Surgical Fitters are conducted from time to time in a great many cities, both large and small, throughout this country and in Canada and Europe. Classes range in size anywhere from three or four members of a department of one particular store to two hundred fitters from many stores. Class rooms are hotel assembly rooms or Camp branch offices. The larger schools—held in eight principal cities—last a full week.

Six lectures in all are given . . . on the anatomy and physiology concerned with the mammary gland, visceroptosis, hernia, postoperative, pregnancy and orthopedic conditions. A skeleton, charts, stereopticon slides and motion pictures: These are equipment used by the Camp medical director. A handbook carefully compiled is the textbook for the course, a textbook which the surgical fitter retains for reference.

After this technical background, there follows a practical exposition of the principles involved in the design of Camp supports. Actual patients obtained from clinics of leading hospitals serve as models and are fitted before the class.

Table talks and intimate discussions relating to everyday problems encountered by fitters in their store work are carried on following the classwork. Experienced Camp nurses and instructors are in charge, and they attempt to give each student-fitter personal attention. Fitters are instructed not to diagnose or treat disease, and do not fit garments except in coöperation with physicians.

S. H. Camp & Company has conducted these schools for surgical fitters for eight years. Several thousand fitters have thus learned why supports are prescribed and exactly how to adjust Camp garments typed to body build . . . all without cost to the stores or the fitters . . . and to the end that your patients may be accurately fitted. This is an important part of the Camp Professional Support Service.

S. H. CAMP & COMPANY of CANADA, Ltd.

Manufacturers

Windsor, Ontario, Canada



CAMP PROFESSIONAL SUPPORT SERVICE

Accepted by the Council on Physical Therapy of the American Medical Association

MEDICAL BOOKS

H. K. LEWIS & CO. LTD.

Medical Publishers & Booksellers

Large Stock of Text-Books and Recent Literature in all Branches of Medicine and Surgery. Books Advertised or Reviewed in this Journal Supplied Promptly on Request.

Periodicals supplied at Subscription Rates.

COLONIAL LIBRARIES, COLLEGES AND SIMILAR INSTITUTIONS

Special facilities for executing Large Orders for Shipment to all parts of the World.

SECOND-HAND BOOK DEPARTMENT,
140 GOWER STREET,
—Catalogues post free on application.—

Old and rare books sought for and reported free of charge.

To Residents in Canada, South Africa, Australia, etc.

Lewis's can supply
(Direct by First Mail)

The Publications of all Publishers.

Books sent by C.O.D. where facilities available

Any Book in General Literature not in Stock
Supplied to Order

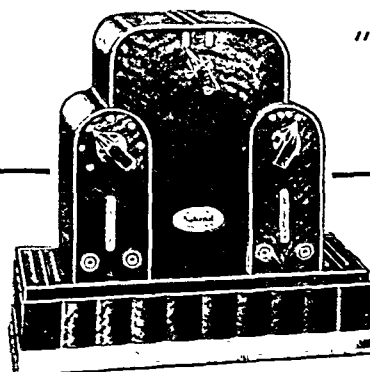
LONDON:

H. K. Lewis & Co. Ltd., 136 Gower St., W.C.1

It's a "National" NEW National CAUTERY

featuring

"THE HIDDEN SHELF"
plus the "Dual Position"
CAUTERY PISTOL
with the "Trigger Lock"



OPHTHALMOSCOPE

Double-Disc

"Neicomold"

Full Range

- COLOR FILTERS—clear light—daylight—red free.
- UNUSUAL RANGE—96 Dioptric values.

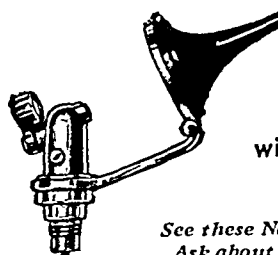


National

OTOSCOPE

(Patented)

with "Neicomold" Specula
and Flashlight Bulb

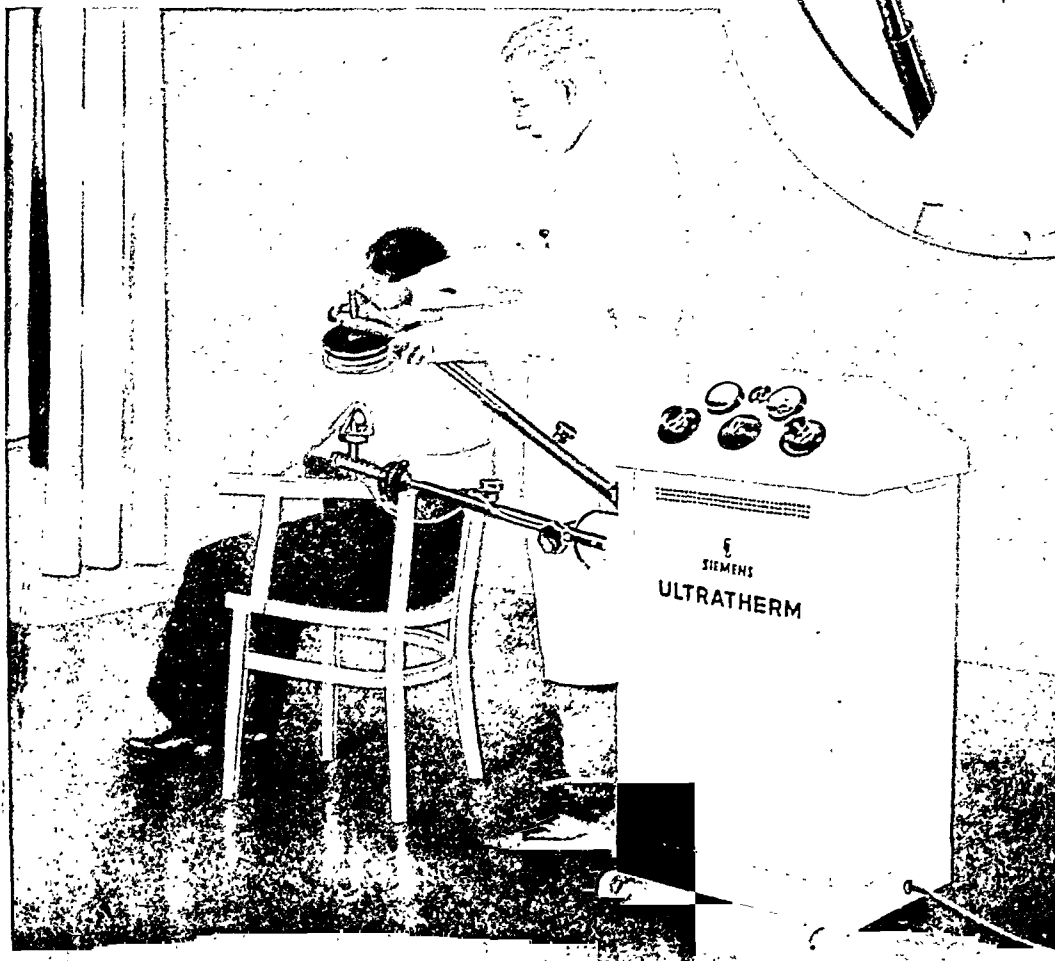
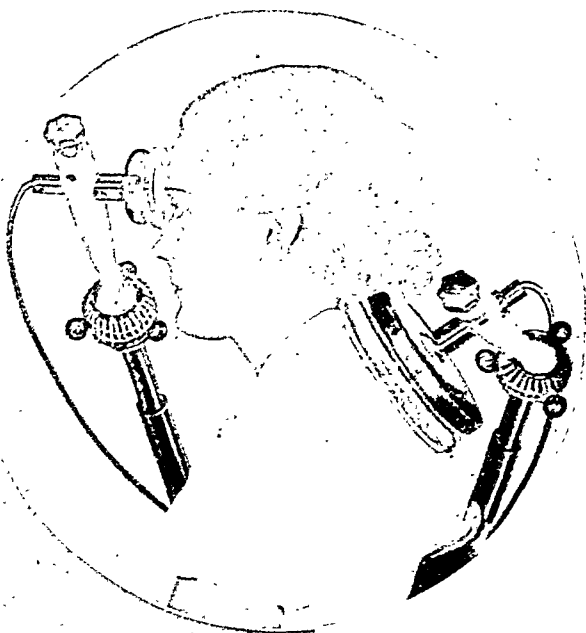


See these National Instruments at your dealer's
Ask about the TWIN TRANSILLUMINATOR

National Electric Instrument Co. 36-10 SKILLMAN AVENUE
LONG ISLAND CITY, N. Y.

FOR ULTRA SHORT-WAVE THERAPY

Treatment of a sinus condition by Siemens ULTRATHERM short wave unit illustrating the easy adaptability of electrode arms.



Treatment by Siemens ULTRATHERM (Note: 6 meter wave length and 300 watts output in the patient's circuit.)

We wish to invite all doctors attending the annual meeting of the Canadian Medical Association at Victoria B.C. to visit the Siemens-Reiniger exhibit, booth 13. Representatives will be pleased to demonstrate the latest models of Siemens X-ray and Electro-medical equipment. Illustrated literature will be available describing Ultra Short Wave Therapy Units. You may prefer to write direct for comprehensive clinical data by well known authorities in the profession.

SIEMENS-REINIGER (CANADA) LIMITED
DOMINION SQUARE BUILDING, MONTREAL
TORONTO • WINNIPEG • VANCOUVER



SIEMENS

HOMewood SANITARIUM

GUELPH, ONTARIO



HOMewood is a private hospital for nervous, mental and habit cases; specially equipped to provide all forms of treatment, such as;—Occupational Therapy, Electrotherapy, Hydrotherapy, Massage and games, (tennis, bowling, croquet, bridge, billiards, etc.)
30 ACRES of natural park, lawns and flower gardens.

Write or telephone for booklet and rates.

ADDRESS: DR. HARVEY CLARE, Medical Superintendent, Guelph, Ontario
PHONE GUELPH 53

A Palatable Nervine Stimulant and Antispasmodic

BROVALONE

Hartz

BROVALONE *Hartz* has proven itself effective in the treatment of functional derangements associated with Neurosis, Insomnia and Hysteria. Its prompt action is possibly due to the special menstruum which promotes rapid absorption without stomach irritation.

BROVALONE *Hartz* combines the finest quality Valerian Root with Bromide, skilfully blended in correct proportions by careful *Hartz* chemists.

Dose: One to four fluid drachms.

A Canadian Product from the Laboratories of

The J. F. HARTZ CO. LIMITED

Physicians' Supplies

TORONTO

..

MONTREAL



Try This

When Patients Object To No-Coffee Diets

Most physicians agree that the psychological effect of submitting cheerfully to a diet often determines its complete effectiveness.

And one of the hardest of all things for a coffee-lover to give up is coffee. But Kellogg has now made it so easy to remove caffeine from the diet of caffeine-sensitive patients, that you don't have to say "Give up coffee" or even "Drink a coffee substitute". All you have to say is "Change your brand to Kaffee-Hag Coffee".

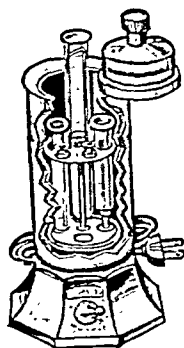
For Kellogg has at last found a way to take out 97% of the caffeine and leave 100% of the flavor in. It's real coffee . . . a blend of the finest Brazilian and Colombian crops . . . rich, full-flavored, satisfying.

So, instead of putting your patients on a no-coffee diet, why not make it easier for them and for you by suggesting the new improved Kaffee-Hag?

A Professional Sample will be sent upon request

KELLOGG COMPANY OF CANADA, LIMITED
LONDON, ONTARIO

GOMCO DIABETIC'S STERILIZER



*For sterilizing needles and syringes and
for testing urine*

A new electric water boiler. Ideal for diabetics and physicians. Sterilizes needles and syringes quickly. Excellent for testing urine. Interchangeable plate accepts 4 test tubes. Heavy metal base, chrome plated, prevents tipping. Copper boiler with aluminum shell. Underwriters approved cord and switch. See it at your dealer's. Only \$8.50.

GOMCO SURGICAL MFG. CORPORATION
87-91 Ellicott Street Buffalo, N. Y.
Sales Offices: Toronto, Canada; Los Angeles, Cal.

For ARTHRITIS and CHRONIC RHEUMATISM

Prescribe

LYXANTHINE ASTIER

Its formula—iodo-propanol-sodium sulphate, lysidin bitartrate, calcium gluconate, sodium bicarb, tartaric and citric acids—supplies calcium, iodine and sulphur, with a powerful uric acid solvent.

LYXANTHINE ASTIER

GRANULAR EFFERVESCENT

clinically effects rapid disappearance of tissue infiltration, relieves pain, promotes protein-waste elimination, exerts chologogue action.

*DOSAGE, 1 teaspoonful well dissolved
in a glass of water every morning, on
an empty stomach, for 20 days. Rest
10 days. Repeat if necessary*

Write for information and sample

Dr. P. ASTIER LABORATORIES

36-48 Caledonia Road, Toronto 350 LeMoine St., Montreal

Sick Room

You will find many uses for Lavoris about the sick room. Here, indeed, occasions arise at every hand when its free use will largely contribute to the patient's comfort and well-being.

During illness, as in febrile conditions when breath is foul, tongue dry and mouth generally unsanitary, Lavoris cleanses, deodorizes and lessens dangers from absorption, ingestion and aspiration of toxic material.

Spraying Lavoris about the room freshens the air. Applying Lavoris to irritated skin soothes and toughens tender surfaces.



Sample
on
Request

LAVORIS

MADE
IN
CANADA

Lavoris Chemical Company Limited, 92 Jarvis Street, Toronto, Canada

D^R COLLECTEM



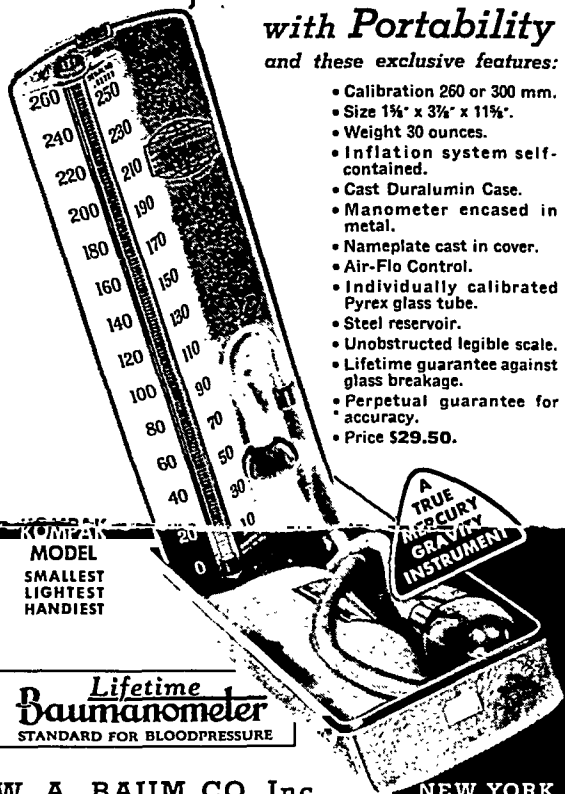
That's The Message from our medical and dental clients all over Canada, Doctor. Won't you feel a whole lot happier, too, with the Medical Audit collecting your past-due accounts on a "No Collection, No Charge" basis—with our cheque going forward to you, Each Tuesday, on the Imperial Bank, Adelaide and Victoria Streets, Toronto?

THE MEDICAL AUDIT ASSOCIATION

44 VICTORIA STREET, TORONTO

precise **ACCURACY**
with **Portability**
and these exclusive features:

- Calibration 260 or 300 mm.
- Size 1½" x 3½" x 11½".
- Weight 30 ounces.
- Inflation system self-contained.
- Cast Duralumin Case.
- Manometer encased in metal.
- Nameplate cast in cover.
- Air-Flo Control.
- Individually calibrated Pyrex glass tube.
- Steel reservoir.
- Unobstructed legible scale.
- Lifetime guarantee against glass breakage.
- Perpetual guarantee for accuracy.
- Price \$29.50.




MODEL
SMALLEST
LIGHTEST
HANDIEST

Lifetime
Baumanometer
STANDARD FOR BLOODPRESSURE

W. A. BAUM CO. Inc. NEW YORK
SINCE 1916 ORIGINATORS AND MAKERS OF
BLOODPRESSURE APPARATUS EXCLUSIVELY

ALKALI-FORMING
APPETITE-PROVOKING



VI-TONE

Rich food-drink, nourisher and restorative. Notable preventive and corrective of Nutritional Acidosis. A carefully balanced combination of proteins, fats, carbohydrates, calcium, phosphorus, iron, and vitamins B and G. VI-TONE is both appetite-provoking and easily digested.

VI-TONE COMPANY

HAMILTON - CANADA

Modern,

efficient banking service —
backed by the resources, ex-
perience and reputation of 118
years' successful operation.

TOTAL ASSETS
IN EXCESS OF
\$750,000,000



BANK OF MONTREAL

Established 1817

In Canada,
from now on,
Diabetosan is named
"DIA-TOSAN"

Dr. H. LABBE, Associate Professor of the Faculty of
Medicine of Paris and E. DONARD'S

(I. G. B.)

DIA - T O S A N

PREPARED IN THE SOUDAN LABORATORIES OF PARIS

A pure vegetable product containing no
chemical salts. It has no noxious effects on
the liver, kidneys and thyroid body.

LIGHT and MEDIUM CASES of DIABETES: 8 to 12 tablets per day, in three separate doses
immediately before meals.

SEVERE CASES of DIABETES: As an adjuvant to insulin, suppressing 1/3 of the units: 12 tablets
per day, in three separate doses, immediately before meals.

DERMATOSES: Eczema, acne, furunculosis: 9 tablets per day, in three separate doses, immediately
before meals.

FATTENING CURES: Tuberculosis, etc.: 8 tablets per day, in three separate doses, immediately
before meals.

ABSOLUTELY HARMLESS

children:
half this amount

UNLIMITED TOLERANCE

The highest scientific references


General Agent:

Literature on request

L. BOUDOT, 8955 Routhier St., Montreal, P.Q., Tel. DUpont 4350

NO. 26 of a Series of Advertisements prepared in the Interest of Acetanilid B.P. by BROMO-SELTZER Ltd.

RELIEF of PAIN



The Physician's
NO. 2 FUNCTION*

ACETANILID

Promptly Relieves Pain Of All Nerve Origin

*Fantus holds that the relief of pain is second only to the saving of life. (J. A. M. A. Dec. 22, 1934.) The physician, when choosing an analgesic, considers these major factors — efficiency — promptness — safety — non-habit-forming properties.

Acetanilid and acetphenetidin fully meet these requirements of an analgesic. They promptly relieve all pain of nerve origin by blocking the synapses and preventing pain sensation from reaching the higher centres. They do this safely, as widely cited in the literature, without injury to heart, kidneys, brain centres, blood pressure, etc. They have never been proven to be habit-forming.

For rapid diminution of pain in a safe, economical manner, the physician has at his disposal a scientifically produced pharmaceutical. Acetanilid and acetphenetidin with their synergists, caffeine and bromides, for maximum results with minimum dosage, are given in a palatable, refreshing drink. Citrates bring about favorable alkalization.

Generous trial supply is at your disposal upon request

BROMO - SELTZER LTD., TORONTO, CAN.



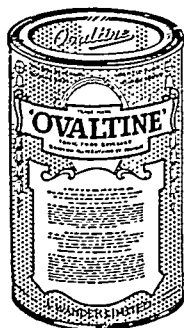
When Visiting London

buyers should make a point of calling at British Industries House, where all the most modern British medical equipment may be examined in comfort under one roof. Whether it is Hospital, Medical, Pharmaceutical or Ophthalmic apparatus that is required, it will be possible to get estimates and tenders at competitive prices, in the minimum time and without unnecessary travelling expense. Visits should be made and enquiries sent to

BRITISH INDUSTRIES HOUSE

MARBLE ARCH . . LONDON . . ENGLAND

A Nerve Nutrient



For nervous patients—women suffering from neurasthenia—men tired out with business worries . . . nervously exhausted . . . irritable . . . sleepless and depressed—recommend what physicians the world over recommend—

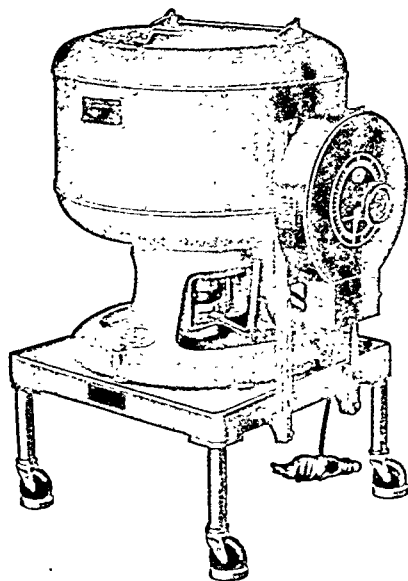
OVALTINE

TONIC FOOD BEVERAGE

INTERNATIONAL "SIZE 2" --



a popular model



INTERNATIONAL
Size 2 Centrifuge with Stand

Of all the various sizes and types of International Centrifuges the Size 2 best meets the demands for heavy duty and as an auxiliary in the busy laboratory. Research Laboratories demand this particular centrifuge because of its wide field of usefulness. It is the centrifuge with overload capacity, protective starting device and flexible speed control.

REASONS for the "SIZE 2"

- Large capacity and power.
- Adaptability to wide range of accessory equipment, including the new Conical Heads.
- Designed for continuous or intermittent duty.
- Self-contained unit and easily portable.

SEND FOR NEW C2-1936 BULLETIN

Fully illustrated and descriptive of new accessories

INTERNATIONAL EQUIPMENT COMPANY

352 Western Avenue

Makers of Fine Centrifuges

Boston, Mass., U.S.A.

THE EASILY DIGESTED CARBOHYDRATES FOR INFANT FEEDING FORMULÆ

For the feeding of normal infants these purest of Corn Syrups may be added to milk mixtures in approximately the same proportion as the other carbohydrates used in infant feeding. When it is desirable to give additional calories, however, the amount of "CROWN BRAND" or "LILY WHITE" CORN SYRUP in the formulæ may safely be increased to a reasonable extent, because of the fact that these products are so easily digested and are unlikely to set up gastro-intestinal disturbances.

Many thousands of successful cases have proven the value of these pure Corn Syrups as an efficient and economical carbohydrate for use in infant feeding.



EDWARDSBURG "CROWN BRAND" CORN SYRUP and "LILY WHITE" CORN SYRUP

Manufactured by THE CANADA STARCH COMPANY Limited
Montreal and Toronto

FOR THE MEDICAL PROFESSION

A convenient pocket calculator, with varied infant feeding formulæ employing these two famous corn syrups, and a scientific treatise in book form for infant feeding, also prescription pads, are available on request. Kindly clip the coupon and this useful material will be mailed to you immediately.

THE CANADA STARCH CO, Limited
Montreal

Please send me

- ☐ FEEDING CALCULATOR.
☐ Book "CORN SYRUPS FOR INFANT FEEDING".
☐ PRESCRIPTION PADS.

Name

Address

six weeks POST-GRADUATE COURSES

offered by
the A.M.A. of **VIENNA**

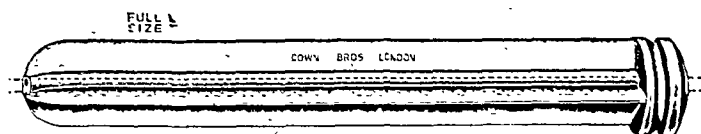
Group sailing, July 8, S.S. "PRES. ROOSEVELT"

next groups Sept. 9, 1936 and Feb. 10, 1937

For information and descriptive pamphlet apply

COMPASS TRAVEL BUREAU

55 West 42nd. Street . . . New York City



Canalized Stainless Steel Nail

INSTRUMENTS FOR FRACTURES OF THE FEMORAL NECK

by

Smith-Petersen

Sven-Johansson

Watson-Jones, Etc.

DOWN BROS. LTD.

(London, Eng.)

143 College Street, Toronto

Manufacturers of
SURGICAL INSTRUMENTS
and
HOSPITAL EQUIPMENT

Sole Agents in Canada for:—

London Hospital Catgut.

James Swift's Microscopes.

Rayner's Optical Instruments.



For The "CURE"

**White Sulphur
Springs** *west virginia*

European Baths ~ American Facilities

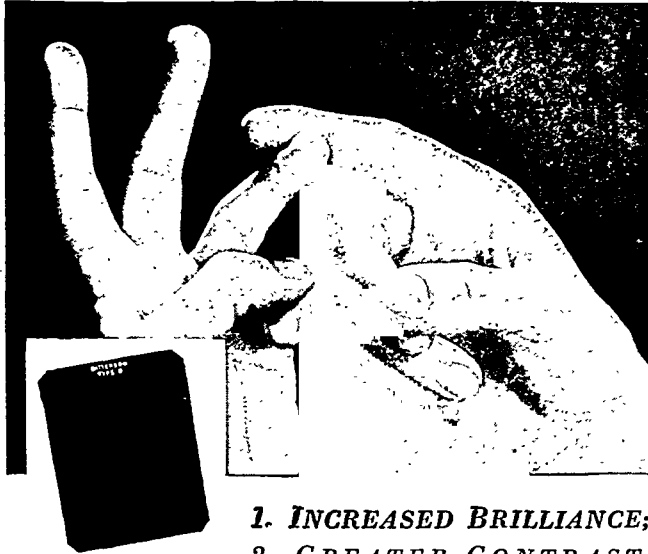
The Greenbrier and Cottages
open all year round

DR. GUY HINSDALE, Director
Medical and Bath Department

L. R. JOHNSTON
General Manager

3 great advantages

of the Patterson Type B Fluoroscopic Screen . . .



1. **INCREASED BRILLIANCE;**
2. **GREATER CONTRAST;**

3. **OPERATION AT LOWER VOLTAGES**—these are the three outstanding advantages of the Patterson Type B Fluoroscopic Screen. Radiologists everywhere report that this Patterson Screen greatly facilitates their fluoroscopic diagnosis.

★

SO FAVORABLE have been the experiences of radiologists who have used the Patterson Type B Fluoroscopic Screen that we invite you to ask any user of this screen for his opinion of it.

Far more brilliant than any previous Fluoroscopic Screens, this improved screen eliminates many of the handicaps heretofore encountered in fluoroscopic work. As fluoroscopic screens at their best are limited in brilliance, radiologists will readily appreciate how greatly the materially increased brilliancy of the Type B Screen facilitates fluoroscopic diagnosis.

Your dealer will gladly give you a demonstration.

THE PATTERSON SCREEN COMPANY
Dept. C.M.A.J. Towanda, Penn., U. S. A.

Patterson



INTENSIFYING **Screens** FLUOROSCOPIC

SCREEN SPECIALISTS FOR MORE THAN 20 YEARS

Consistently Satisfactory



DIAPHRAGMATIC HERNIA OF STOMACH
Radiograph courtesy of Montreal General Hospital, and Dr. W. L. Ritchie, Director of Department of Roentgenology.

- No x-ray film excels ILFORD in production of consistently good radiographs.

Leading x-ray men approve—and use —ILFORD FILM, having learned that it can be relied upon as to speed, superior detail, and uniform high quality.

We, too — old timers in knowledge of radiographic values—recommend

Ilford X-Ray Film

and carry complete, FRESH stocks at Vancouver, Winnipeg, Toronto and Montreal.

VICTOR X-RAY CORPORATION



of Canada, Ltd.



Distributors for General Electric X-Ray Corporation

TORONTO—30 Bloor St. W., Toronto, Ont. • MONTREAL—524 Medical Arts Bldg. • VANCOUVER—Motor Transportation Bldg. 570 Dunsmuir St. • WINNIPEG—Medical Arts Bldg. Wholesale Warehouse, 389 St. Paul St. W., Montreal, P. Q.

ACNE associated with adolescence responds more readily to this dietary aid

In one large clinic, it resulted in satisfactory clearing of lesions in 89% of cases

For years physicians have been prescribing Fleischmann's fresh Yeast for the acne of adolescence. As a supplement to usual medical treatment in severe cases, they find it speeds complete recovery. In milder types, it is often sufficient as the sole therapeutic measure.

Many tests have been made by doctors to determine the effect of daily yeast feeding on skin lesions. In one large clinic, 89% of cases of the adolescent type of acne were satisfactorily cleared up.

THE hyperactivity of the endocrine system at puberty and during adolescence is reflected in the secretions of the sebaceous glands. The sebum may change in both quality and quantity. As a result *acne vulgaris*, of varying degrees of intensity, commonly appears at this time in those areas where the sebaceous glands are most abundant—the face, the shoulders, the chest. Bloch* has reported the presence of acne in 64% of 4,191 boys and girls between 8 and 19 years of age.

The clinical importance of acne vulgaris is obvious when its possible effects are considered:

1. When *acne vulgaris* is neglected during adolescence, it may become a chronic condition and persist well on into middle life.
2. There is always the possibility of permanent scarring from persistent *acne vulgaris*.
3. Adolescent boys and girls are so often embarrassed by a "pimply skin" that they develop a lasting feeling of inferiority.

Other Factors which Influence the Development and Persistence of Acne . . .

In addition to the primary effect of gland hyperactivity on the skin, the general health and diet of the young boy and girl play important rôles in the etiology of acne vulgaris.

Irregular hours and habits, lack of discrimination in choice of foods, over-indulgence in sweets and fats are all common problems of adolescence. As a result, gastro-intestinal difficulties are often present—principally constipation.

What Fleischmann's Yeast Will Do

Fleischmann's fresh Yeast supplies essentials which are most needed at adolescence. It contains four of the five important vitamins, *i.e.*, Vitamins A, B, G, and D. It is an especially rich source of B and G. It also supplies amino-acids, vital to growth processes. In addition, being fresh yeast, it supplies hormone-like substances which stimulate gastric secretions, thus aiding measurably in the digestion and assimilation of food.



UNLESS CLEARED UP quickly, acne vulgaris may become a chronic condition—leaving permanent scars. Boys and girls are often so embarrassed by this malady that they develop a lasting feeling of inferiority.

By its beneficial action on the secretions and musculature of the gastro-intestinal tract, Fleischmann's Yeast speeds up the elimination of waste products in a natural way. Thus fewer toxins are thrown into the blood stream to act as irritants to the skin.

* * * *

Moreover, its vitamins have a regulating effect on the gland dysfunction associated with acne, *i.e.*, dysfunction often characterized by increased thyroid activity to compensate for gonad activity due to imbalance of the endocrines.† Vitamins B and G in yeast have also a direct vitalizing effect on the tissues themselves, enabling the skin to throw off the lesions, healing itself more quickly, hence with less danger of scarring.

In addition to a speedier recovery from the skin lesions, doctors find that Fleischmann's Yeast improves the general health and tone of patients. There is a feeling of greater aliveness and alertness, an increase in the sense of "well-being." The recommended method of yeast therapy is: 2 cakes of Fleischmann's fresh Yeast daily, plain or dissolved in $\frac{1}{2}$ glass of Water, preferably half an hour before meals.

Buy Made-in-Canada Goods

* BLOCH, Bruno, "Metabolism, Endocrine Glands and Skin Diseases, with special reference to Acne Vulgaris."

British Journal of Dermatology, Feb. 1931.

† HOLLANDER, Lester, "The Role of the Endocrine Glands in the Etiology and Treatment of Acne."

Archives of Dermatology and Syphilology, 3: 393-597, March 1921.



"Past Regrets and Future Fears"

In addition to difficulty in putting away the cares and worries of "dead yesterday" and "unborn tomorrow" some of your sleepless patients have the additional hurdle of fear. Fear—engendered by recollection of other sleepless nights—that sleep, so much needed, will again elude them; fear that continued loss of sleep will break down health.

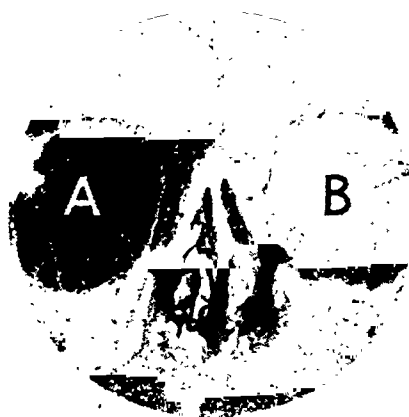
Insomnia, whatever the cause, may easily become chronic, and establishment of normal sleep habits frequently requires temporary use of a hypnotic.

Ortal Sodium is effective—one five-grain capsule will usually induce quiet, restful sleep (a three-grain capsule is often sufficient). Its effect is not unduly prolonged; the patient is usually alert and refreshed the following morning.

Ortal Sodium (sodium hexyl-ethyl barbiturate) is supplied in capsules of 3/4, 3, and 5 grains, in bottles of 25, 100 and 500.



PARKE, DAVIS & CO., Walkerville, Ont.



The X-Ray casts light on nasal treatment

The illustration shows an antero-posterior X-Ray view of the nasal passages. The dark marking in Nostril B shows the relatively slight spread of solution applied by medicine dropper. Marking in Nostril A, on the other hand, shows how thoroughly the same solution spread when applied by a DeVilbiss Atomizer.

To obtain effective nasal self-treatment prescribe a DeVilbiss Atomizer. Prices now fit any pocketbook. Incidentally, we shall be glad to send you complete data on the X-Ray tests referred to above.

DeVilbiss

The DeVilbiss Mfg. Co., Limited, Windsor, Ontario, headquarters for atomizers and vaporizers for professional and home use

• Palatable . . . and non - irritating . . . in the treatment of coughs . . . grippe . . . and bronchitis

There is never any reluctance on the part of children or adults in taking Liquid Peptonoids with Creosote. It is palatable, non-irritating and can be retained by the most sensitive stomach. Clinical test will prove the value of this product as a bronchial expectorant and sedative. The coupon will bring samples and literature.

Liquid Peptonoids with Creosote

THE ARLINGTON
CHEMICAL CO.
YONKERS, NEW YORK



W. LLOYD WOOD, LIMITED.
Canadian Agent.

64-66 Gerrard St. E., Toronto C.M.J.-6-36

You may send me at the address below
a sample of Liquid Peptonoids with Creosote.

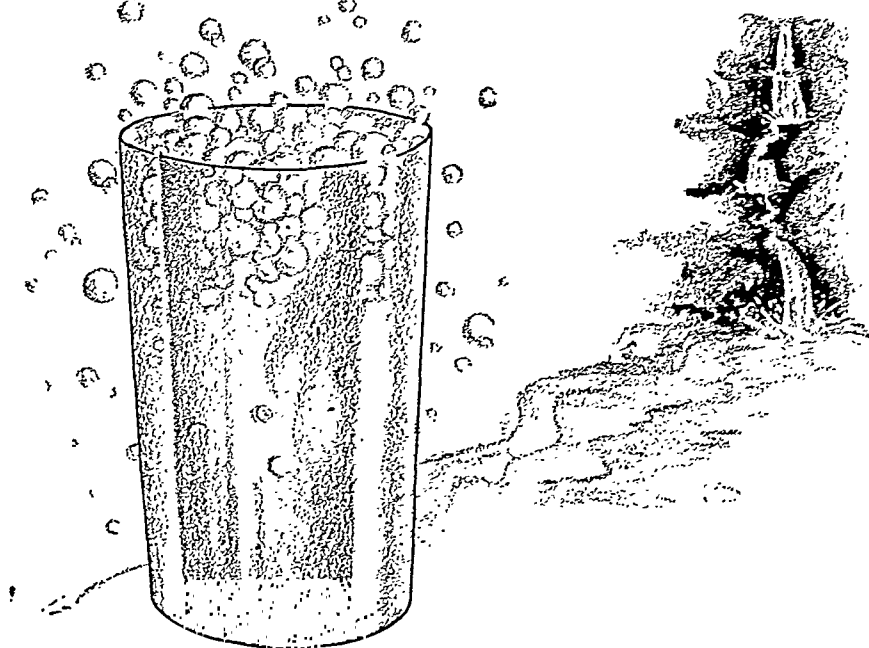
Dr. _____

Address _____

City _____ Prof. _____

7 Synergists Secure and Support

ALKALINE LEVEL OF PLASMA



SAL HEPATICA contributes a rationally blended combination to accomplish tissue-plasma alkaline restoration. Its seven principal components are the same as those of famous aperient Spring Waters.

By acting on the lower bowel without disturbing gastric or duodenal enzymes, Sal Hepatica

proves itself to be a safe and effective laxative which soon produces a distinct feeling of well-being.

Sal Hepatica is a pleasant, effervescent restorative after over-indulgence of any kind.

Recommend Sal Hepatica to your patients. Send for clinical supply.

SAL HEPATICA CLEANS THE INTESTINAL TRACT AND COMBATS ACIDITY

BRISTOL-MYERS COMPANY
1241-C Benoit Street,
Montreal, Canada.

Please send me without charge professional sample and literature on Sal Hepatica.

..... M.D.
(Please enclose card)

St. & No.

City Prov.





Will Vacation Time Spell T-R-O-U-B-L-E For Some of your Little Patients

Each year brings its quota of trouble from children drinking raw milk while on vacation. The fact that raw country milk looks creamy and good often leads parents to overlook its possible dangers.

When there is any doubt about the summer milk supply . . . it is much safer to prescribe Klim. All milk that is accepted for Klim must pass the most rigid tests for purity and quality in all the dairy industry. It is then pasteurized and powdered for safety and convenience.

Klim is far more than simply a pure, safe, unmodified whole milk. It assures the two vitally important factors of *easy digestibility* and *absolute uniformity*. Klim, because of its finely divided casein and its small butterfat globule, promotes digestion and assures a high degree of assimilation.

*At your request, we will gladly supply samples
of Klim and Literature*

The Borden Company, Limited, Yardley House, Toronto

KLIM

POWDERED WHOLE MILK

Also: C. M. P. Powdered Protein Milk. C. M. P. Powdered Lactic Acid Milk.
Borden's Irradiated Evaporated St. Charles Milk.

Ergoapin (Smith)

Breaks the vicious circle of perverted menstrual function in cases of amenorrhea, tardy periods (non-physiological) and dysmenorrhea. Affords remarkable symptomatic relief by stimulating the innervation of the uterus and stabilizing the tone of its musculature. Controls the utero-ovarian circulation and thereby encourages a normal menstrual cycle.

MARTIN H. SMITH COMPANY

150 LAFAYETTE STREET, NEW YORK, N. Y.

Full formula and descriptive literature on request



Dosage: 1 to 2 capsules 3 or 4 times daily. Supplied in packages of 20.

Ethical protective mark MHS embossed on inside of each capsule, visible only when capsule is cut in half at seam.

MOLSON'S ALE

FAMOUS FOR PURITY
AND WHOLESOMENESS

SINCE 1786

Canadian Doctors Treat Successfully

WHOOPIING COUGH

and other persistent coughs, with

ELIXIR BROMAURATE

Cuts short the period of the illness, reduces the frequency of the attacks, relieves the distressing cough and gives the child rest and sleep.

Also valuable in BRONCHITIS and BRONCHIAL ASTHMA

IN FOUR-OUNCE ORIGINAL BOTTLES—A teaspoonful every 4 hours.

GOLD—An interesting booklet on "Gold in the Treatment of Whooping Cough and Other Diseases" sent on request. Drop us a card.

GOLD PHARMACAL CO. — — NEW YORK

TRUSSES

The Spot-Pad, Non-Skid truss has been developed during 42 years of manufacturing. It is the result of a conscientious attempt to furnish an entirely practical, safe, comfortable and sanitary appliance of the highest quality.

Also Makers Of

Airway Surgical Supports Umbilical Trusses
Maternity Supporters
Non-Skid Arch Supporters Crutches

Professional Discount

OTTAWA TRUSS CO. of Canada Limited
304 Wellington Street — Ottawa

To incise or not to incise . . .

is no longer the question, for it is generally conceded that conservative treatment is the better part of judgment in the management of

BOILS

CARBUNCLES

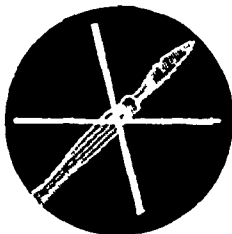
ABSCESSSES

FURUNCULOSIS

CELLULITIS

Because it is hyperaemic in effect and exerts bacteriostatic and decongestive actions, Antiphlogistine is among the topical applications of choice in the management of these acute septic conditions.

In the early stages it encourages resolution without suppuration; but it is also of the greatest value when suppuration is imminent, when it should be applied to the parts as hot as can be borne, leaving a central aperture for drainage.



Unlike the ordinary bland ointment and boric acid dressings, Antiphlogistine does not tend to spread the infection, but to prevent it.

Sample on request

ANTIPHLOGISTINE

THE DENVER CHEMICAL MANUFACTURING COMPANY

153 Lagauchetiere St. W., Montreal

*For Metabolism Studies and
Oxygen Therapy*

SODASORB

(An improved type of Wilson Soda Lime)

THE BEST ABSORBENT FOR CARBON DIOXIDE

For the past ten years, Wilson Soda Lime has been recognized by leading hospitals in America as the outstanding CO₂ absorbent for use in metabolism apparatus and the oxygen tent. Sodasorb, made according to the original Wilson formula, possesses all of the outstanding advantages of Wilson Soda Lime and in addition is even more efficient as an absorbent.

NON-DELIQUESCENT
MOST ECONOMICAL
MOST EFFICIENT
MOST ACCURATE

Please Write For Further Details

DEWEY & ALMY CHEMICAL CO.
of Canada Ltd.

Sales Offices and Warehouses:
National Terminal Bldg. - Montreal, Que.
Factory: Farnham, P.Q.

REDUCES FUNCTIONAL HYPERTENSION

QUICKLY:

A large proportion of the thousands of reports received stress the extent of the reduction within the very first week.

EFFICIENTLY:

The reduction of blood-pressure is not ephemeral. Many reports end with the remark: "The blood-pressure was then reduced to . . . where it has remained ever since."

ECONOMICALLY:

Many cases show a reduction of from 30 to 50 mm. within a week—at a cost of not more than one dollar.

ANABOLIN

Vials of fifteen tablets. On prescription only.
Bottles of fifty tablets. Boxes of five 1-cc. ampules.
One package—a week's supply—proves its worth.

The HARROWER LABORATORY, Inc.

Canadian Distributors:

WILFRED G. NOBLE, LTD.

64 Gerrard St. East - Toronto 2



A distinct departure from other
local treatments

- NO BANDAGING IS REQUIRED
- READILY ABSORBED
- NON-STAINING
- NON-GREASY
- ANTI-SEPTIC
- ANTI-PRURITIC
- ANTI-PARASITIC

MAZON SOAP

- ABSOLUTELY PURE
- NO SYNTHETIC PERFUME
- NO ARTIFICIAL COLORING
- NO FREE ALKALI
- FOR PERSONAL HYGIENE

On Sale
Dependable Pharmacies

Mazon Soap
cleanses and
prepares the skin
for the absorption
of Mazon.

Distributors
Wholesale Druggists

INFANTILE ECZEMA

Completely Eliminated 13 Days

The baby, born April 10, 1934, developed eczema in October. Practically the entire body was covered.

The father states: "We have been absolutely unable to find any remedy that would give even alleviation. Dr. M. H., of Charlotte, N.C., advised the use of this (Mazon) ointment, and, as is obvious from the pictures, improvement was immediate."



Photographed Feb. 9, 1935



Photographed Feb. 22, 1935

Samples and literature
on request.

LAURENTIAN AGENCIES, LTD.
560 DeCourcelles St.
Montreal, Que.
Gentlemen: Please send me FREE samples, and
literature, of Mazon and Mazon Soap.

Dr.
Address
City

He can depend on us



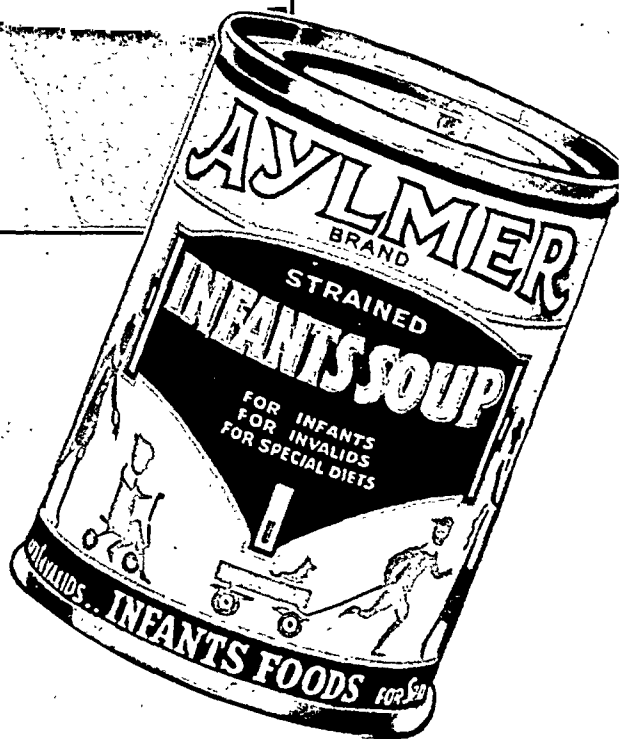
*Carefully selected fruits and vegetables—every phase
of production faithfully supervised
by graduate chemists.*

Peas	Spinach	Tomatoes
Beets	Apricots	Asparagus
Beans	Prunes	Carrots
Apple Sauce		Infants Soup

Samples free on request

AYLMER Research Laboratory

CANADIAN CANNERS LIMITED
HAMILTON CANADA



AYLMER
INFANTS FOODS

**Ready for instant
use, anywhere...**



ARGYROL TABLETS FOR CONVENIENT, EXACT, FRESH SOLUTIONS

Today many physicians find great convenience in the use of Argyrol tablets. These tablets are pure Argyrol, no binder being used. They not only insure accuracy, purity and genuineness but also save time because a fresh, potent solution is thus made available at a moment's notice in the doctor's office, in the operating room and at the bedside. In certain progressive hospitals the ward nurse makes a fresh solution as required instead of using the stock solution prepared in the pharmacy. Four tablets (6 grains each) dropped into a half-ounce of water make a 10 per cent solution in a few minutes; other strengths in proportion.

Argyrol is a unique compound, chemically unlike any other silver salt. Although it is the prototype

of all mild silver proteins, none of the imitative preparations so classified contains silver in the same physical and chemical state as Argyrol; nor do they contain proteins of the same character.

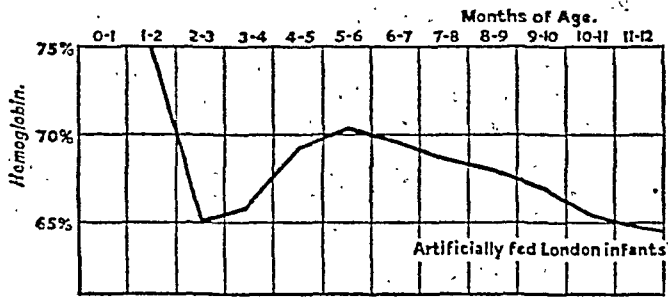
Then, too, it is interesting to note that among the U.S.P. mild silver proteins on the market there is a wide variation in hydrogen ion concentration from less than seven to more than eleven. This means that some products are very much more alkaline than others. This fact no doubt has much to do with the irritation noted by doctors when Argyrol substitutes are used in place of Argyrol. Argyrol's hydrogen ion concentration is always close to nine regardless of the solution used.

There is ONE . . . only ONE . . . ARGYROL, made only by

A. C. BARNES COMPANY, LIMITED
STE-THERESE, P.Q.

for 33 years sole makers of Argyrol and Otoferrin. "Argyrol" is a registered trade-mark, the property of A. C. Barnes Co. Ltd.

Nutritional Anemia in Infants



Hemoglobin level in the blood of infants of various ages. Note fall in hemoglobin, which is closely parallel to that adapted from Mackay. It is from birth by feeding Dextrinized Malt Food. After the third month Pablum offers substantial amounts of iron for both breast- and bottle-fed babies.

Reasons for Early Pablum Feedings

1. The iron stored in the infant's liver at birth is rapidly depleted during the first months of life. (Mackay,¹ Elvehjem.²)
2. During this period the infant's diet contains very little iron—1.44 mg. per day from the average bottle formulae of 20 ounces, or possibly 1.7 mg. per day from 28 ounces of breast milk. (Holt.³)

For these reasons, and also because of the low hemoglobin values so frequent among pregnant and nursing mothers (Coons,⁴ Galloway⁵), the pediatric trend is constantly toward the addition of iron-containing foods at an earlier age, as early as the third or fourth month. (Blatt,⁶ Glazier,⁷ Lynch⁸.)

The Choice of the Iron-Containing Food

1. Many foods reputed to be high in iron actually add very few milligrams to the diet because much of the iron is lost in cooking or because the amount fed is necessarily small or because the food has a high percentage of water. Strained spinach, for instance, contains only 1 to 1.4 mg. of iron per 100 gm. (Bridges.⁹)
2. To be effective, food iron should be in soluble form. Some foods fairly high in total iron are low in soluble iron. (Summerfeldt.¹⁰)
3. Pablum is high both in total iron (30 mg. per 100 gm.) and soluble iron (7.8 mg. per 100 gm.) and can be fed in significant amounts without digestive upsets as early as the third month, before the initial store of iron in the liver is depleted. Pablum also forms an iron-valuable addition to the diet of pregnant and nursing mothers.

Pablum (Mead's Cereal thoroughly cooked and dried) consists of wheatmeal, oatmeal, cornmeal, wheat embryo, brewers' yeast, alfalfa leaf, beef bone, iron salt and sodium chloride.

¹⁻¹⁰ Bibliography on request.

MEAD JOHNSON & CO. OF CANADA, LTD., Belleville, Ont.

Please enclose professional card when requesting samples of Mead Johnson products to cooperate in preventing their reaching unauthorized persons

The Canadian Medical Association Journal



ANNUAL MEETING
Canadian Medical Association
June 22 - 26, 1936
VICTORIA, B.C.

THE OFFICIAL ORGAN OF
THE CANADIAN MEDICAL ASSOCIATION
AND ITS AFFILIATED PROVINCIAL MEDICAL ASSOCIATIONS

PUBLISHED MONTHLY BY
THE CANADIAN MEDICAL ASSOCIATION
3640 UNIVERSITY STREET, MONTREAL

[PRICE SEVENTY-FIVE CENTS PER COPY]

[COPYRIGHTED]

TWO NEW 1936 BOOKS

DISABILITY EVALUATION—Principles of Treatment of Compensable Injuries. 333 Illustrations..... \$9.00
By EARL D. McBRIDE, B.S., M.D., F.A.C.S., Assistant Professor in Orthopedic Surgery, University of Oklahoma School of Medicine; Chief of Staff to Reconstruction Hospital, Oklahoma City.

The purpose of this volume is to interpret the physiological and mechanical alterations arising out of injury to the motor structures of the human body, and to reasonably appraise and evaluate the extent of functional loss as it relates to the economic incapacity of the injured. Enables you to determine, appraise and evaluate the difference between the person as he was before his injury and the variation from normal after recovery. It gives the extent in disability in terms of percentage of loss of the use of the body.

PASSIVE VASCULAR EXERCISES AND THE CONSERVATIVE MANAGEMENT OF OBLITERATIVE ARTERIAL DISEASES OF THE EXTREMITIES. Illustrated with 76 engravings and 4 colored plates.. \$6.00

By LOUIS G. HERRMANN, M.D., Assistant Professor of Surgery, and Director of the Vascular Disease Clinics, Cincinnati General Hospital.

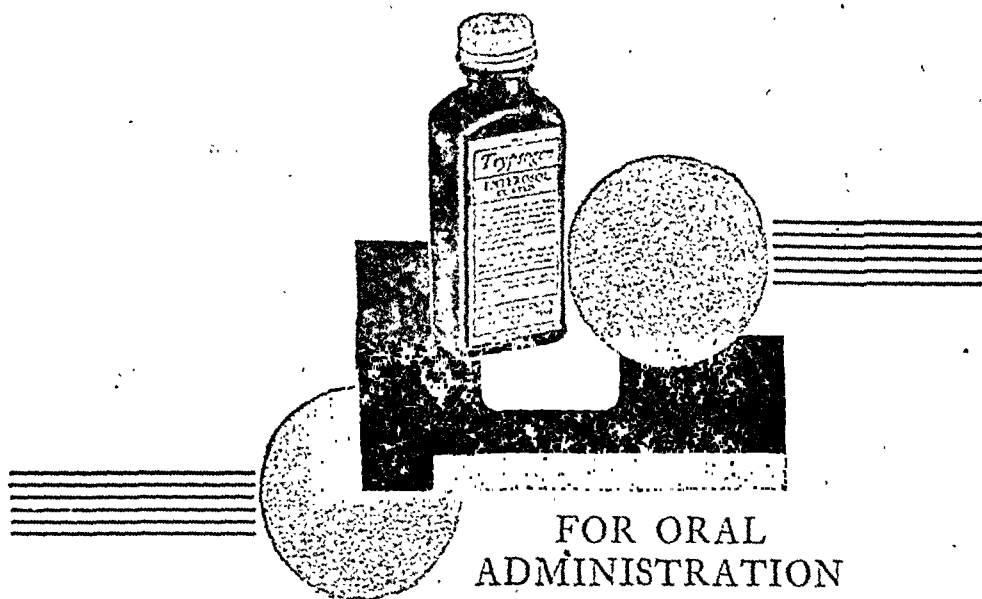
This new work serves to throw some new light on certain aspects of this most difficult clinical problem. The various operations upon the autonomic nervous system have added much to the comfort of the patients. The data presented is the result of three years of intense application of this physical method of treatment in their clinics.

J. B. LIPPINCOTT COMPANY, PUBLISHERS

525 CONFEDERATION BUILDING
MONTREAL

A COMBINATION of all of the active derivatives
of the pancreas which control carbohydrate
digestion.

TRYPSOGEN



FOR ORAL
ADMINISTRATION

Supplied with Enterosol Coating to insure the
passage through the stomach for immediate
absorption in the intestine.

*Bottles of 100, 500 and 1000 tablets,
Plain or Enterosol Coated.*

G. W. CARNRICK CO., LTD.

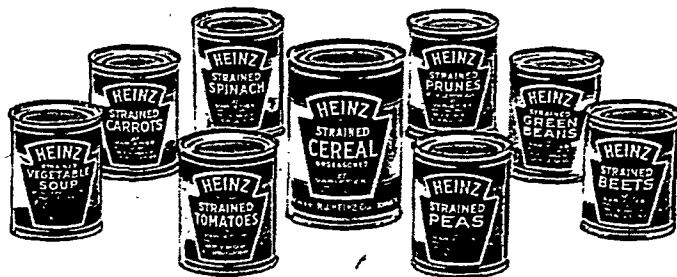
20 Mt. Pleasant Ave.

Newark, N. J.

HEINZ

STRAINED BABY FOODS

with assured vitamin content



VALUABLE IN CASES
OF TONSILLECTOMY

SOME OF THE
FAMOUS 57

Vol-34 - No-4

Do you prescribe them, doctor?

● It is difficult to have vegetables, fruits and cereals cooked and strained in the home kitchen as uniformly good and nutritious as are Heinz Strained Foods.

Heinz use all their special facilities in securing products fresh from the garden. It is a matter of hours, merely, from the time they are gathered until they are being scientifically prepared. There is no long-time cooking to destroy vitamins, no loss of minerals in the cooking-water. Heinz Vegetables are cooked quickly under dry steam, then finely sieved, free from air, packed under vacuum into enamel-lined tins, and sterilized.

The result is that Heinz strained vegetables keep in high degree their natural vitamin strength and the mineral salts which promote healthful growth. All condensate and juices are retained.

Even finical babies, hard to feed, like and thrive upon Heinz Strained Foods. The time to begin depends upon your judgment of the case; many doctors say about the 4th or 5th month.

Heinz Strained Foods are natural in colour and flavour and are unseasoned. For older persons on a soft diet, or for cases of Tonsillectomy where these foods are prescribed on account of a throat condition, salt and butter to taste may be added.

There are nine distinct varieties: Strained Tomatoes, Strained Beans, Strained Prunes, Strained Carrots, Strained Vegetable Soup, Strained Beets, Strained Peas, Strained Spinach, Strained Cereal.

PLEASE ACCEPT 6 FULL-SIZE TINS

Heinz feels that if you give Heinz Strained Foods a trial you will prefer them, and so offers you, free of cost or obligation, an assortment of any six varieties. Merely write for them on your professional stationery, to H. J. Heinz Company, Toronto, Ontario.

Prepared in our Canadian plant at Leamington and sold by most good dealers throughout Canada at moderate prices.

The Canadian Medical Association Journal

Editor, A. G. NICHOLLS, M.A., M.D., D.Sc., F.R.S.C., F.R.C.P.(C.)
3640 University Street, Montreal

Vol. 34

APRIL, 1936

No. 4

Contents

	Page		Page
Intracranial Division of the Vestibular Portion of the Auditory Nerve for Ménière's Disease. <i>K. G. McKenzie</i>	369	Ileus Associated with Transient Renal Insufficiency. <i>N. B. Gwyn</i>	412
The Radiological Findings in Pre-pyloric Lesions. <i>A. C. Singleton</i>	382	Some Entozoa of Man as seen in Canada and South Africa. <i>H. B. Fantham and A. Porter</i>	414
Artificial Pneumothorax in Lobar Pneumonia: Report of Ten Cases. <i>J. G. Howlett, R. Luff and E. B. Astwood</i>	387	Visceral Behaviour in Neuroses. <i>D. G. Campbell</i>	422
Hodgkin's Disease of Bone. <i>M. C. Morrison</i>	393		
Oxycephaly, with the Report of Two Cases in a Brother and Sister. <i>D. L. Klein and A. E. Childe</i>	397	CASE REPORTS	
Protamine Insulin. <i>R. B. Kerr, C. H. Best, W. R. Campbell and A. A. Fletcher</i>	400	A Case of Bilateral Paralysis of the Laryngeal Abductors of Influenzal Origin. <i>J. N. Roy</i>	427
Mesenteric Lymphadenitis in Adolescents Simulating Appendicitis. <i>D. C. Collins</i>	402	Transmission of Malaria by Blood Transfusion. <i>F. T. Cadham</i>	428
The Significance of Menopausal Flowing. <i>W. P. Tew</i>	405	Ichthyosis. <i>L. M. Mullen</i>	430
Making Ether an Ideal Anæsthetic. <i>W. N. Kemp</i>	409		
		CLINICAL AND LABORATORY NOTES	
		The Bitterling Test for Pregnancy. <i>R. Gottlieb</i>	431
		A Simple Device for Drying Blood Diluting Pipettes. <i>M. C. Dinberg</i>	432

CONTINUED ON PAGE IV

Use **ANGIER'S** to overcome
the enervating after effects of

INFLUENZA - GRIPPE
BRONCHITIS - PNEUMONIA

It exerts positive tonic and reconstructive benefits

Desirable combinations:

Angier's Emulsion with Ferric et Ammonium Citrate
Angier's Emulsion with Hydriodic Acid
Angier's Emulsion with Mist. Glyc. Compound
Angier's Emulsion with Codeine Phosphate
(First dissolve in a little water)

WINGATE CHEMICAL CO. LTD.
378 West St. Paul St., Montreal, Que.

Gentlemen:— Kindly send me free sample of
Angier's Emulsion.

Name

Address

Canadian Distributors:

The Wingate Chemical Co., Ltd.
378 West St. Paul St. - Montreal, Que.

Important Facts When Considering the Selection of the Proper Bismuth Salt

- *It is now generally admitted that for a given method of administration, the activity of bismuth compounds depends chiefly on their bismuth content.*
- *Intramuscular injections of water-soluble preparations (unless too poor in Bi. content to produce lasting therapeutic effect) are relatively rapidly absorbed and eliminated, and show an increased tendency to the development of toxic symptoms. In addition, these preparations are usually also not very well tolerated locally.*
- *Insoluble salts of bismuth when injected remain *in situ* for a considerable period and must presumably be converted by the organism into water-soluble or lipoid soluble derivatives before they can be utilized. This slow and gradual absorption ensures a prolonged spirochaeticidal action, thus avoiding "shock" and immediate toxic effects which are likely to occur with the use of water-soluble salts of bismuth.*

The above considerations have guided our choice of NEO-LUATOL and BIS-GLUCOL as the best form of bismuth compounds for treating syphilis.



"Poulenc"

An oily solution of Bismuth Hydroxide

Intramuscular injections always well tolerated, slowly and gradually absorbed.

Prolonged spirochaeticidal action.

Supplied in ampoules of 2 c.c., each containing 0.16 Gm. of metallic bismuth.

12's, 50's and 100's

Bottles of 30 c.c.



"Poulenc"

Bismuth metal suspension in isotonic glucose solution.

1 c.c. of suspension—0.2 Gm. of Bi. metal.

Uniform absorption sufficiently rapid to eliminate danger of accumulation to a minimum.

Constant therapeutic action. Painless intramuscular injection.

Rubber-capped bottles of 25 c.c.

Laboratory Poulenc Frères
OF CANADA LIMITED - MONTREAL

Distributors: ROUGIER FRÈRES - 350 Le Moyne Street - MONTREAL

CONTENTS CONTINUED FROM PAGE II

	Page		Page
EDITORIALS		SPECIAL CORRESPONDENCE	
The Diagnosis of Coronary Disease	433	London Letter	460
The Medico-legal Aspect of Arsenical Poisoning	435	Edinburgh Letter	461
The Relation of Climate to Tuberculosis	436	MEDICO-LEGAL	
Our Medico-legal Department	437	Summary of Canadian Legislation of Medical Interest Passed During 1935	462
EDITORIAL COMMENT		ABSTRACTS FROM CURRENT LITERATURE	
I. P. Pavlov	438	Medicine	466
SPECIAL ARTICLES		Surgery	468
Obstetrics in Rural Saskatchewan. <i>I. Stewart</i>	439	Obstetrics and Gynæcology	469
The Ethics of Medical Practice. <i>D. A. Stewart</i>	442	Pædiatrics	469
MEN AND BOOKS		Ophthalmology	470
The Centenary of Samuel Butler. <i>H. E. MacDermot</i>	443	Oto-Rhino-Laryngology	470
ASSOCIATION NOTES		Urology	471
The Annual Meeting, Victoria, June 22nd to 26th	445	Anæsthesia	472
Report of the Study Committee on Cancer	447	Therapeutics	472
Report of the Department of Hospital Service	448	Pathology and Experimental Medicine	473
Constitution and By-laws Applicable to Divisions	449	OBITUARIES	
HOSPITAL SERVICE DEPARTMENT NOTES		R. L. Blackadar	474
Hospital Statistics for Canada	454	J. A. Gadbois	474
Hospital Internships for Theological Students	454	F. W. Hill	474
PROVINCIAL ASSOCIATION NOTES		R. W. Hiscock	474
Ontario Medical Association, annual meeting, London, May 26th to 29th: preliminary program	455	L. W. Johnstone	474
MEDICAL SOCIETIES		M. H. Langs	474
Academy of Medicine, Toronto	457	F. H. Kalbfleisch	474
Montreal Physiological	457	NEWS ITEMS	
		Canada	476
		United States	482
		General	482
		Book Reviews	482

Printed by MURRAY PRINTING COMPANY, LIMITED, 192 SPADINA AVENUE, TORONTO 2.

NOVARSAN

*Obtainable in three
packagings to suit
your individual
requirements*

A CANADIAN PRODUCT

Novarsan Solution

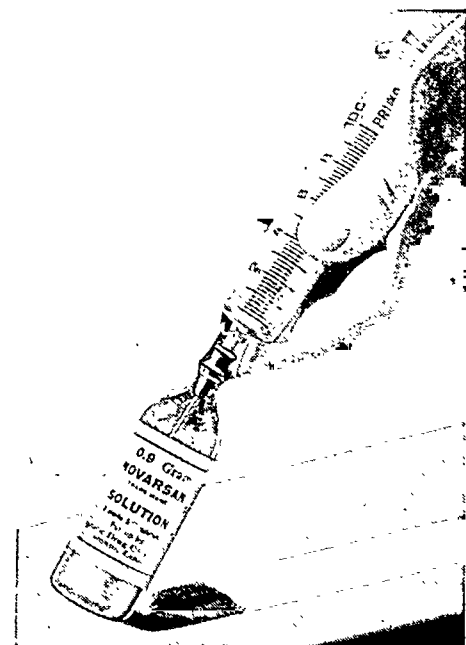
Ready to inject.
Less toxic due to special solvent.
To be used within the 3 months
dating period.

Novarsan Powder

Absolutely stable.
Low toxicity.
As used by 20 independent
Departments of Health in the
British Empire.

Novarsan Combination

Absolutely stable.
Less toxic due to special solvent.
Easy to prepare—dissolve powder
in ampoule solvent provided.



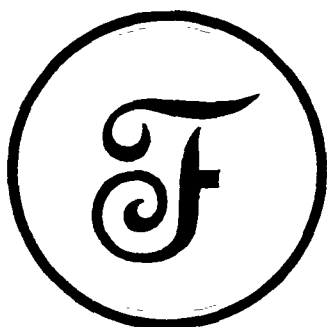
NOVARSAN
NEOARSPHENAMINE

SYNTHETIC DRUG CO. LTD.

TORONTO

243 College St.

Midway 8055



Timely formulae

ACETOPHEN CO. with CODEINE

C.T. No. 222 "Frosst"

R_x Acetophen, 3½ gr.
Phenacetin, 2½ gr.
Caffeine citrate, . . . ½ gr.
Codeine phosphate, ⅛ gr.

ACETOPHEN CO. with CODEINE, R₂

C.T. No. 282 "Frosst"

R_x Acetophen, 3½ gr.
Phenacetin, 2½ gr.
Caffeine citrate, . . . ½ gr.
Codeine phosphate, ¼ gr.

ACETOPHEN CO. with CODEINE, R₃

C.T. No. 292 "Frosst"

R_x Acetophen, 3½ gr.
Phenacetin, 2½ gr.
Caffeine citrate, . . . ½ gr.
Codeine phosphate, ½ gr.

DOSE, ONE OR TWO TABLETS, AS DIRECTED BY PHYSICIAN

Bottles of 100 and 500 tablets.



Charles E. Frosst & Co.

Montreal, Canada

The Canadian Medical Association Journal

The Official Organ of the Canadian Medical Association and of all Provincial Medical Associations of Canada

Editorial Office, 3640 University St. - Montreal

CENTRAL EDITORIAL BOARD

Editor, A. G. Nicholls, M.A., M.D., D.Sc., F.R.S.C., F.R.C.P.(C.)

Assistant Editor, H. E. MacDermot, M.D., F.R.C.P.(C.)

Managing Editor, F. S. Patch, M.D.

Maude E. Abbott; E. W. Archibald; A. T. Bazin; F. G. Finley; A. Grant Fleming; D. Sclater Lewis;

C. F. Martin; J. C. Meakins; L. C. Simard

CORRESPONDING MEMBERS

J. W. Crane; P. C. Dagneau; N. B. Dreyer; J. G. FitzGerald; J. Miller, Ross Mitchell; Alan Rankin.

CHAIRMEN OF PROVINCIAL EDITORIAL BOARDS

ALBERTA—G. E. Learmonth, Calgary.

BRITISH COLUMBIA—D. E. H. Cleveland, Vancouver.

MANITOBA—Ross Mitchell, Winnipeg.

NEW BRUNSWICK—A. S. Kirkland, Saint John.

NOVA SCOTIA—J. S. MacLennan, C. W. Holland.

ONTARIO—J. H. Elliott, Toronto.

P. E. ISLAND—J. A. McPhee, Summerside.

SASKATCHEWAN—Lillian Chase, Regina.

MEMBERSHIP including *Journal*, \$10.00. Subscription to *Journal* is \$6.00 and is limited to Libraries, Hospitals and doctors residing outside Canada. Volume commences with January and July Issues. Index in June and December Issues.

CONTRIBUTIONS

EXCLUSIVE PUBLICATION: Articles are accepted for publication on condition that they are contributed solely to this *Journal*. Arrangements for simultaneous publication may be made under exceptional circumstances.

COPYRIGHT: Matter appearing in the *Journal* is covered by copyright under the Copyright Act of 1921, but, as a general rule, no objection will be made to the reproduction in reputable medical journals of anything in these columns, provided proper credit is given.

MEMORANDUM FOR CONTRIBUTORS

MANUSCRIPTS: Should be *typewritten, double-spaced*, and the *original copy* submitted, otherwise they cannot be accepted.

REFERENCES: Should be arranged as follows:

In the case of a Journal: ROBINSON, A. L.: Exophthalmic goitre, *J. Am. M. Ass.*, 1919, 72: 1327. The black face type (72:) stands for the volume. In a typewritten manuscript the volume number should be underlined.

In the case of a book: KLEIN: Micro-organisms of Disease, Macmillan, London, 1st ed., 1896, p. 151.

Bibliographies are tending to become so cumbersome that frequently the *Journal* has to omit them for lack of space. Contributors are asked to give only the most important references.

ILLUSTRATIONS: Will be paid for by us when satisfactory photographs or drawings are supplied by the author. Negatives are not acceptable. Each illustration, table, etc., should bear the author's name on the back. Photographs should be clear and distinct, preferably black and on glazed paper; drawings should be made in india ink on white paper. For illustrations requiring cuts the best copper plate is used and all are printed on glazed paper. The *Journal* reserves the right to limit the number of illustrations. Contributors are respectfully requested to limit illustrations to such as are absolutely necessary.

REPRINTS: These may be ordered by contributors from the printers upon the form submitted with the galley proof.

ADVERTISEMENTS

First advertising forms go to press thirty days in advance of the date of issue. In forwarding copy, time must be allowed for setting up and submitting proof. Advertising rates on request.

N.B.—We endeavour to exclude from our columns all unethical advertisements and appreciate notification from our readers relative to any misrepresentation.

CLASSIFIED ADVERTISEMENTS are payable in advance. To avoid delay in publishing, remit with order. Advertisements under the following headings cost \$2.00 for each insertion of 40 words or less, additional words 5 cents each.

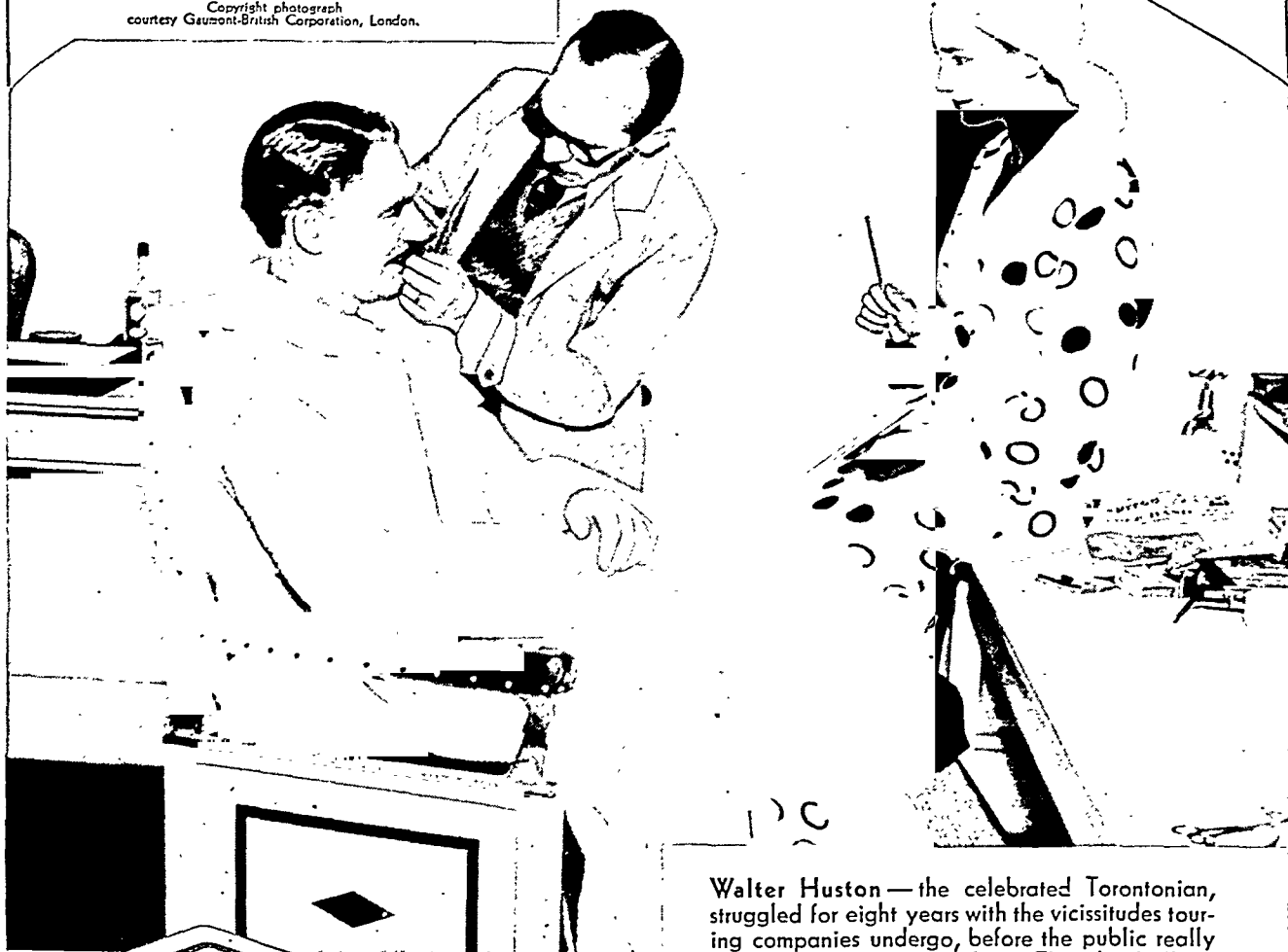
WANTED: Apparatus, Assistant, Books, Location, Partner, Partnership, Situation.

FOR SALE: Apparatus, Practice, Sanitaria, Drug Stores.

THE SMOKE OF THE BRITISH EMPIRE

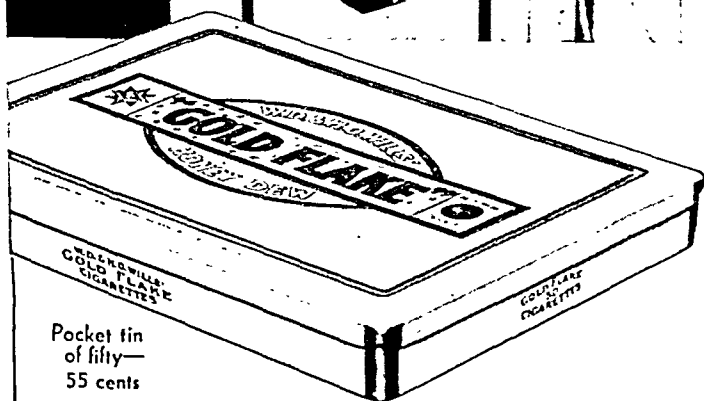
In "Rhodes", the Gaumont-British picture shortly to be released in Canada, Walter Huston gives a superb characterization of the great Imperialist, Cecil Rhodes. Be sure to see it at your local theatre.

Copyright photograph
courtesy Gaumont-British Corporation, London.



Walter Huston—the celebrated Torontonian, struggled for eight years with the vicissitudes touring companies undergo, before the public really recognized his great ability. Then his brilliant performances could no longer be confined to a few hundred spectators a night. The screen claimed him and for it he has done his finest work.

This "still" shows him being made up for the name part in the Gaumont-British film "Rhodes", in which he brings that famous Empire-builder back to vibrant life before your eyes. On the "Rhodes lot" at Shepherd's Bush, or in the Matabele Country film camps, the preferred cigarette was always W. D. & H. O. Wills' Gold Flake—the favourite "smoke" of English stage and screen stars.



Pocket tin
of fifty—
55 cents

W. D. & H. O. WILLS'

GOLD FLAKE

CORK TIP OR PLAIN
CIGARETTES

A shilling in London—a quarter here

The Canadian Medical Association

Affiliated with the British Medical Association

President—J. C. MEAKINS, Montreal.

President-Elect—H. M. ROBERTSON, Victoria.

Chairman of Council—G. S. YOUNG, Toronto.

Honorary Treasurer—F. S. PATCH

Editor—A. G. NICHOLLS

3640 University Street, Montreal.

General Secretary—T. C. ROUTLEY, 184 College Street, Toronto.

Associate Secretaries—G. HARVEY AGNEW, Toronto; A. GRANT FLEMING, Montreal.

THE GENERAL COUNCIL

G. S. YOUNG, Toronto, *Chairman*

J. D. Adamson, Winnipeg	J. T. Fotheringham, Toronto	D. C. Malcolm, Saint John	J. F. McNeill, Summerside
G. A. B. Addy, Saint John	W. W. Francis, Montreal	J. K. Malloy, Cardston	W. D. McPhail, Kindersley
G. Harvey Agnew, Toronto	John Fraser, Montreal	C. F. Martin, Montreal	J. A. McPhee, Summerside
A. E. Archer, Lamont	W. E. Gallie, Toronto	A. T. Mathers, Winnipeg	F. C. Neal, Peterborough
J. Fenton, Argue, Ottawa	Léon Gérin-Lajoie, Montreal	J. C. Meakins, Montreal	A. G. Nicholls, Montreal
J. M. Barry, Saint John	H. A. Gibson, Calgary	A. H. Meneely, Coronation	J. R. Nugent, Saint John
Gordon Bates, Toronto	J. C. Gillie, Fort William	H. H. Milburn, Vancouver	F. S. Patch, Montreal
A. T. Bazin, Montreal	Duncan Graham, Toronto	D. P. Miller, Prince Albert	G. R. Peterson, Saskatoon
C. H. Best, Toronto	Roscoe R. Graham, Toronto	Ross Millar, Ottawa	Paul Poirier, Montreal
V. E. Black, Moose Jaw	H. G. Grant, Halifax	W. T. B. Mitchell, Montreal	A. Primrose, Toronto
Jas. E. Bloomer, Moose Jaw	S. E. Grondin, Quebec	E. W. Montgomery, Winnipeg	O. W. Prowd, Vancouver
Wesley Bourne, Montreal	John Gunn, Calgary	W. L. Muir, Halifax	George A. Ramsay, London
William Boyd, Winnipeg	W. Hackney, Calgary	A. R. Munroe, Edmonton	J. W. Richardson, Calgary
Alan Brown, Toronto	R. H. M. Hardisty, Montreal	G. H. Murphy, Halifax	G. W. Rogers, Dauphin
J. F. Burgess, Montreal	N. MacL. Harris, Ottawa	H. H. Murphy, Victoria	F. W. Routley, Toronto
W. G. M. Byers, Montreal	R. I. Harris, Toronto	Daniel Murray, Tatamagouche	T. C. Routley, Toronto
G. Stewart Cameron, Peterborough	A. K. Haywood, Vancouver	E. R. Myers, Saskatoon	E. Stanley Ryerson, Toronto
J. A. Couillard, Lake Edward	J. J. Heagerty, Ottawa	H. E. MacDermot, Montreal	H. B. Small, Ottawa
L. L. Charpentier, Drummondville	V. E. Henderson, Toronto	J. S. McEachern, Calgary	W. Harvey Smith, Winnipeg
H. H. Chown, Winnipeg	W. B. Hendry, Toronto	A. J. McGarity, Kitchener	Howard Spohn, Vancouver
H. H. Christie, Esterhazy	O. M. Hincks, Toronto	J. K. McGregor, Hamilton	G. D. Stanley, Calgary
J. T. Clarke, Ottawa	C. P. Howard, Montreal	R. E. McKechnie, Vancouver	Jas. Stevenson, Quebec
W. V. Cone, Montreal	F. W. Jackson, Winnipeg	S. H. McKee, Montreal	J. A. Stewart, Victoria
A. R. Cunningham, Halifax	W. A. Jones, Kingston	D. W. MacKenzie, Montreal	G. F. Strong, Vancouver
P. C. Dagneau, Quebec	G. R. Johnson, Calgary	J. W. McKenzie, Charlottetown	F. F. Tisdall, Toronto
W. H. Delaney, Quebec	A. Stanley Kirkland, Saint John	K. A. MacKenzie, Halifax	Ethlyn Trapp, Vancouver
C. E. A. DeWitt, Wolfville	W. J. Knox, Kelowna	Murray MacLaren, Saint John	E. Trottier, Montreal
R. W. L. Earle, Perth, N.B.	A. S. Lamb, Vancouver	Hugh MacLean, Regina	G. C. VanWart, Fredericton
J. G. FitzGerald, Toronto	A. D. Lapp, Vancouver	W. J. P. MacMillan, Charlottetown	C. J. Veniot, Bathurst
A. Grant Fleming, Montreal	Forrest Leeder, Victoria	Helen MacMurchy, Toronto	G. J. Wherrett, Ottawa
	A. LeSage, Montreal	D. S. MacNab, Calgary	Ward Woolner, Ayr
	D. Schlater Lewis, Montreal	W. J. McNally, Montreal	C. F. Wyld, Montreal
	David Law, Regina	D. McNeil, Glace Bay	A. MacG. Young, Saskatoon

EXECUTIVE COUNCIL

George S. Young, Toronto	J. G. FitzGerald, Toronto	J. S. McEachern, Calgary	A. G. Nicholls, Montreal
<i>Chairman</i> Léon Gérin-Lajoie, Montreal	K. A. McKenzie, Halifax	F. S. Patch, Montreal	A. Primrose, Toronto
A. T. Bazin, Montreal	Duncan Graham, Toronto	J. C. Meakins, Montreal	H. M. Robertson, Victoria, B.C.
J. E. Bloomer, Moose Jaw, Sask.	A. S. Kirkland, Saint John, N.B.	E. S. Moorhead, Winnipeg	T. C. Routley, Toronto

For names of Sectional Officers, Standing Committees, and Officers of Provincial Medical Associations see alternate issues.

For Control of Pain and Cough—

Dipaudia
dihydromorphinone hydrochloride

COUNCIL
ACCEPTED

A powerful analgesic with several advantages over morphine. Acts quicker and causes fewer undesirable side-effects. A dose of 1/20 grain will generally take the place of 1/4 grain morphine. Dose: for pain 1/32 to 1/16 grain; for cough, 1/96 to 1/24 grain.

Literature upon request from

MERCK & CO. Ltd., 412 St. Sulpice St., MONTREAL - Selling Agents

Manufacturers: Bilhuber-Knoll Corp., Jersey City, N.J.

MARMITE

(REGISTERED TRADE MARK)

Vitamin B Complex Important For the Maintenance of Health

Nutrition surveys show clearly that the best method of raising the standard of public health depends upon the provision of well-balanced meals for all people.

No diet is well-balanced unless it includes an adequate supply of Vitamin B, and there is ample proof that a large proportion of the community is suffering from at least a partial shortage of this complex.

Marmite is being prescribed extensively on account of its high content of both Vitamins B₁ and B₂, and also for its anti-anæmic properties. It is popular because of its pleasant appetising flavour and its economy in use.

For sample and literature write

THE MARMITE FOOD EXTRACT CO., LTD.

Walsingham House, Seething Lane, London, E.C. 3.

or to

MacLAREN-WRIGHT, LTD.

69 Front Street East, Toronto

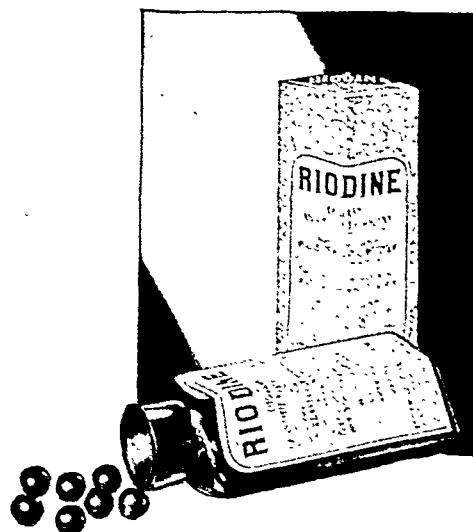
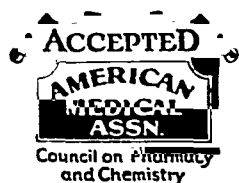
Canadian Distributors

Packed in jars—2 oz., 4 oz., 8 oz. and 7 lb. tins.

Special quotations for supplies in bulk to Hospitals and Institutions.

Effective IODINE MEDICATION

*With the
Undesirable
Features
Minimized*



THE usefulness of iodine therapy is well established, but how to secure it without iodism has long been a problem. In a general sense, of course, iodine therapy is inseparable from iodism, but barring idio-

syncrasies, the severity of the symptoms of iodism is directly proportional to the amount of iodine retained in the blood. This amount, in turn, depends upon the quantity administered.

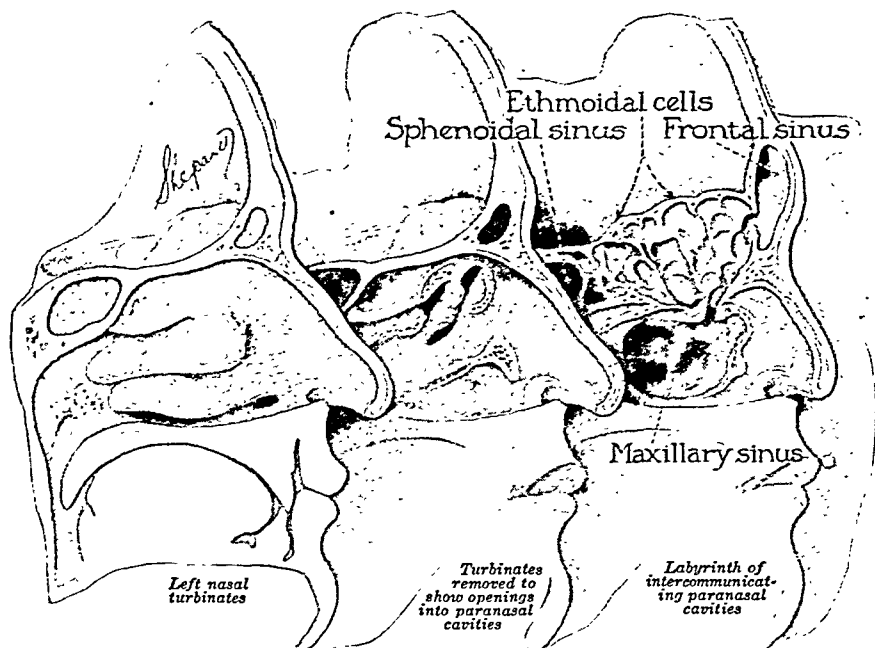
RIODINE (Astier)

Organic Assimilable Iodine

In RIODINE (Astier), which is a 66% solution in oil of an iodized glyceric ether of ricinoleic acid, containing about 17% of iodine, the iodine is held in such a form as to pass through the stomach unchanged as iodized fat and to be absorbed from the intestines. Consequently, it is held in the cells in a lipoid-soluble form and remains in the body for a considerable period of time.

Riodine (Astier) is of obvious advantages in cases where the continuous action of small amounts of iodine is desired, such as *Cardiorenal disturbances, Hypertension (Arteriosclerosis), Bronchial Asthma, Chronic Bronchitis, Pulmonary Emphysema, Chronic Rheumatoid Arthritis, Latent Syphilis, Lead Poisoning, Hypothyroidism, Simple Goitre, Obesity.*

PROLONGED VASOCONSTRICTION



For the relief of nasal congestion

NEO-SYNEPHRIN HYDROCHLORIDE

(levo-meta-methylaminoethanolphenol hydrochloride)

possesses the advantage of sustained action as well as promptness.

Neo-Synephrin Hydrochloride is effective on repeated administration, so that free breathing may be accomplished during the ordinary course of a cold.

DOSAGE FORMS:

Neo-Synephrin Hydrochloride Jelly 1/2% (in collapsible tube)

Neo-Synephrin Hydrochloride Solution 1/4% and 1% (1-oz. bottles)

Neo-Synephrin Hydrochloride Emulsion 1/4% (1-oz. bottles)

Sample and literature on request

FREDERICK STEARNS & COMPANY OF CANADA, LIMITED
WINDSOR, ONTARIO

Detroit, Mich.

San Francisco, Calif.

New York, N. Y.

Kansas City, Mo.

Sydney, Australia

LOW DOSAGE

(IN MILK)

another important
advantage
of this *new* NON-OILY
Crystalline Vitamin D
preparation



ONE of the prominent advantages of the most recent contribution to vitamin D therapy is that when given in milk it excels in antirachitic efficiency. Drisdol in Propylene Glycol diffuses completely in milk, unlike oily preparations which separate from the milk and adhere to the bottle. Investigations have shown that 2 drops of Drisdol in Propylene Glycol, when incorporated in the daily ration of milk, are sufficient for the prevention and cure of infantile rickets. Its use is therefore very economical.

Supplied in bottles containing 5 cc. and 50 cc. Special droppers delivering 250 U.S.P. vitamin D units per drop accompany each bottle.

Write for literature and sample



DRISDOL

TRADEMARK

Crystalline Vitamin D
in propylene glycol



WINTHROP CHEMICAL COMPANY, INC.

Pharmaceuticals of merit for the physician

907 ELLIOTT STREET WEST, WINDSOR, ONT.

Factories: Rensselaer, N. Y.—Windsor, Ont.

MANDELIC ACID B.D.H.

and

SODIUM MANDELATE B.D.H.

For the treatment of urinary infections

The introduction of mandelic acid into modern therapy as a substitute for a ketogenic diet in the treatment of urinary infections is the outcome of an investigation the results of which were reported in *The Lancet* of May 4th, 1935, p. 1032. Results of further clinical cases reported (*Brit. Med. Journ.*, December 7, 1935, p. 1096) would seem to suggest that '... in mandelic acid a really efficient urinary antiseptic has been found, confirming the original claims made for the drug ...'

In the original investigation upon the treatment of urinary infections with mandelic acid, the acid itself (dissolved in water and neutralised with sodium bicarbonate) was administered; latterly the administration of the pure sodium salt has been found to be the more convenient form of treatment.

Mandelic Acid B.D.H. and Sodium Mandelate B.D.H. are available in various standard packages from one ounce to seven pounds.

For successful treatment it is necessary to maintain the pH of the urine at 5.3 or lower, which is effected by regular daily tests of the pH of the urine followed by the administration of appropriate doses of ammonium chloride.

MANDELIC ACID B.D.H. OUTFIT

To facilitate the practice of mandelic acid therapy and to ensure optimum effects the Mandelic Acid B.D.H. Outfit has been designed. The outfit contains the necessary materials for fourteen days' treatment, and there are included also the accessories for controlling the pH of the urine.

●

*Stocks are held by leading druggists throughout the Dominion,
and full particulars are available from*

●

THE BRITISH DRUG HOUSES (CANADA) LIMITED
Terminal Warehouse Toronto 2, Ontario



*Sleep—
calm and restorative
easily induced*



by ⁶⁶MEDINAL-ELIXIR⁹⁹

Delightfully palatable



ORIGINAL-PACKINGS

ELIXIR: bottles of 6 fluid ounces
POWDER: bottles of 1 oz. & 4 ozs.

TABLETS: tubes of 10 and bottles of 100 & 250 tablets
of 5 and 7½ grains each

SCHERING (Canada) Ltd., P. O. Box 358, Montreal

MODERN, EFFICIENT
BANKING SERVICE
... the outcome of 118
years' successful operation

THROUGH all the ups and
downs of business, Canadians
have learned to rely upon the
unwavering strength and helpful
service of Canada's oldest bank.



BANK OF MONTREAL

Established 1817

Prescribe

CITRO-SALONE

Hartz

with Confidence

CITRO-SALONE *Hartz* is a palatable and well-tolerated preparation indicated in cases of acute articular rheumatism, gouty joints, chronic rheumatic arthritis and similar affections. It is anti-arthritic in action and is a reliable and effective treatment. Its administration is not so limited as that of other Salicylate Compounds.

CITRO-SALONE *Hartz* is a splendid Uric Acid Solvent.

Dose: One to two fluid drachms as indicated.

A Canadian Product from the Laboratories of

The J. F. HARTZ CO. LIMITED

Physicians' Supplies

TORONTO

..

MONTREAL

*An important contribution
to vitamin therapy . . .*

NAVITOL

SQUIBB NATURAL VITAMIN OIL

GOOD GENERAL RESISTANCE and firm bone structure are dependent in part upon an adequate supply of Vitamins A and D. Navitol—a new Squibb Vitamin Product—supplies these factors effectively and inexpensively.

The vitamins in Navitol are obtained from *natural* fish liver oil sources. Navitol is as rich in Vitamins A and D as halibut liver oil with viosterol and yet costs 40 per cent less. It is convenient to use and effective in small volume dosage. The oil contains per gram not less than 50,000 Vitamin A units, and 10,000 Vitamin D units. Ten drops (or one 3-minim capsule) supply 8500 Vitamin A and 1700 Vitamin D units, *International Units*.

Navitol is available as follows:

5-cc. bottle of oil (with dropper) \$.75

Box of 25 gelatin capsules85

*For further information write
Professional Service Department
36 Caledonia Road, Toronto, Ont.*

E. R. SQUIBB & SONS of CANADA LTD.
Manufacturing Chemists to the Medical Profession Since 1858



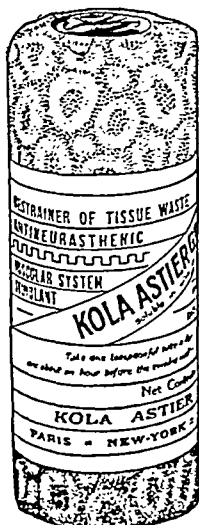
Effective and Dependable

General Stimulation

without

After-Depression

KOLA ASTIER
GRANULATED



Restrainer of Tissue Waste
Anti-Neurasthenic
Heart Regulator
Muscular System Stimulant

for

Cardiac Adynamia
Neurasthenia
Post Influenzal Asthenia
Post-Operative Shock
Senile Involution
Mental and Physical Overstrain
Convalescence

A large percentage of the cases treated by the general practitioner are of an asthenic type and call for the use of some supportive and stimulant treatment.

In all materia medica there is no drug that is better adapted to such a class of cases as Kola—the seed, or nut, of the *Sterculia Acuminata*.

The stimulation of Kola is peculiar in that it is tonic in effect and that, unlike that of ordinary stimulants, it is never followed by after-depression. Its co-operating tonic action maintains its beneficial stimulation.

In KOLA ASTIER GRANULATED, the physician has available to him in convenient form a skilfully prepared standardized extract, containing all the active principles of the Kola Nut: *Caffeine*, *Caffeine-Catechin*, *Theobromine*, *Kola-Red* and *Tannin*. Kola Astier is not habit forming.

Send for Literature and Sample

Agents for Ontario, the Western and Maritime
Provinces:

JOHN A. HUSTON COMPANY, LTD.

36-48 Caledonia Road - Toronto

Agents for the Province of Quebec:

ROUGIER FRÈRES

350 LeMoyne Street - Montreal

CRYSTALLINE VITAMIN C

CEBIONE

[CEVITAMIC ACID MERCK]



THERAPEUTIC INDICATIONS

Scurvy ☆ Prescorbutic Conditions ☆ Hemorrhagic Diseases due to C
Avitaminosis ☆ Supplement to C deficient diets (Sippy, Ketogenic, etc.)
☆ Allergy to those fruits and vegetables containing Vitamin C ☆ ☆

Tablets for oral administration. Crystalline powder for preparing solutions for intravenous use.

AVAILABLE THROUGH THE DRUG TRADE ☆ LITERATURE ON REQUEST

MERCK & CO., Limited *Manufacturing Chemists* MONTREAL

STANNNOXYL

ORAL TREATMENT FOR BOILS ...

•
•
•

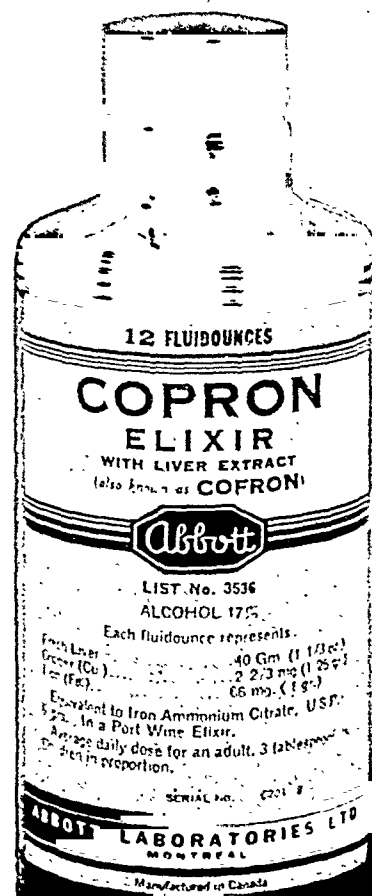
*SAMPLES
and
LITERATURE
ON REQUEST*

•

ANGLO-FRENCH DRUG CO.
354 St. Catherine St. E.
MONTREAL

*Secondary***ANEMIAS**

LIVER EXTRACT
PLUS
1 PART COPPER
25 PARTS IRON

IN

Abbott's Copron Elixir is an agreeable tasting tonic containing whole extract of fresh mammalian livers, with definite amounts of iron and copper in high quality port wine. The liver extract contains the substances active in the formation and maturation of red blood cells. The iron is essential in the structure of hemoglobin, and copper is a "metabolic activator" which is indispensable for iron utilization in the formation of hemoglobin.

Each fluidounce of Copron Elixir represents:

Fresh Liver.	40 grams (1½ ounces)
Iron	66 mgs. (1 grain)
Copper.	2.66 mgs. (1/25 grain)

in high quality port wine.

Abbott's Copron Elixir is a rational, general systemic tonic of exceptional merit because its action is directly concerned in maintaining the proper condition of the blood which is the basic factor of good nutrition. It is indicated in any non-specific condition in which there is a decreased red cell count or a lowered hemoglobin percentage. Detailed information on request; Abbott Laboratories Ltd., Montreal.

Pat. applied for

Abbott's Copron Elixir
 is now put up in the new
POUR-LIP BOTTLE
 An Exclusive Abbott Feature

**ABBOTT'S COPRON ELIXIR**

The Canadian Medical Association Journal

Vol. 34

TORONTO, APRIL, 1936

No. 4

INTRACRANIAL DIVISION OF THE VESTIBULAR PORTION OF THE AUDITORY NERVE FOR MÉNIÈRE'S DISEASE*

By KENNETH G. MCKENZIE,

Toronto

PUBLICATIONS by Dandy,¹ Coleman,² and

Cairns,³ have aroused renewed interest in Ménière's disease, as these authors have shown that there is a dramatic cessation of the severe attacks of vertigo after intracranial section of the eighth nerve. Operation is a particularly suitable treatment for those patients who are prevented from working either on account of the frequency and severity of their attacks or because of danger to themselves or others if an attack should occur while at work. Following operation these patients have a total loss of hearing on the side on which the nerve is cut. Usually this is of little moment because of the severe impairment of hearing existing on the involved side before operation. There are, however, patients suffering from Ménière's disease who have little or no deafness, and obviously if these patients are to be operated upon it is highly desirable to save their hearing if possible. It seemed probable that this could be accomplished by section of the vestibular portion of the nerve without interfering with the function of the cochlear fibres.

Since August, 1931, an attempt has been made to carry out a unilateral section of the vestibular portion of the auditory nerve on twelve patients. As a result of this experience I have concluded that it is possible to section the vestibular portion of the nerve with sufficient accuracy for clinical requirements. The caloric response is abolished and the attacks of vertigo cease, while at the same time the cochlear fibres function as before operation.

The first patient was operated upon in August, 1931, but proved to be an unsatisfactory subject as she had little or no hearing before operation. The second patient, however, had good hearing and satisfactorily proved the possibilities of this new procedure. This second patient was operated upon in July, 1932, and presented before the Surgical Section of the Toronto Academy of Medicine on November 15, 1932.⁴ Cairns³ performed a similar operation in February, 1933. Dandy⁵ operated upon his first patient by this method in March, 1933, although he suggested the operation in 1928.

ANATOMICAL AND SURGICAL CONSIDERATIONS

The vestibular and cochlear fibres arise as the central processes of the bipolar cells of their respective ganglia. The two nerves approach the brain-stem together from the internal auditory meatus and are known as the auditory nerve. In its passage across the posterior fossa the auditory nerve lies lateral and in close approximation to the seventh nerve, from which it is separated by the pars intermedia of Wrisberg.

Prof. G. S. Streeter's⁶ researches on the development of the auditory nerve (Fig. 1) would lead one to expect a fairly complete separation of the cochlear and vestibular fibres close to the internal auditory meatus. However, I have been unable to find an adequate description of this relationship in any of the standard text-books of anatomy, nor do the text-books of histology describe the microscopic difference in the two portions of the nerve.

* Presented before the International Neurological Congress in London, August, 1935.

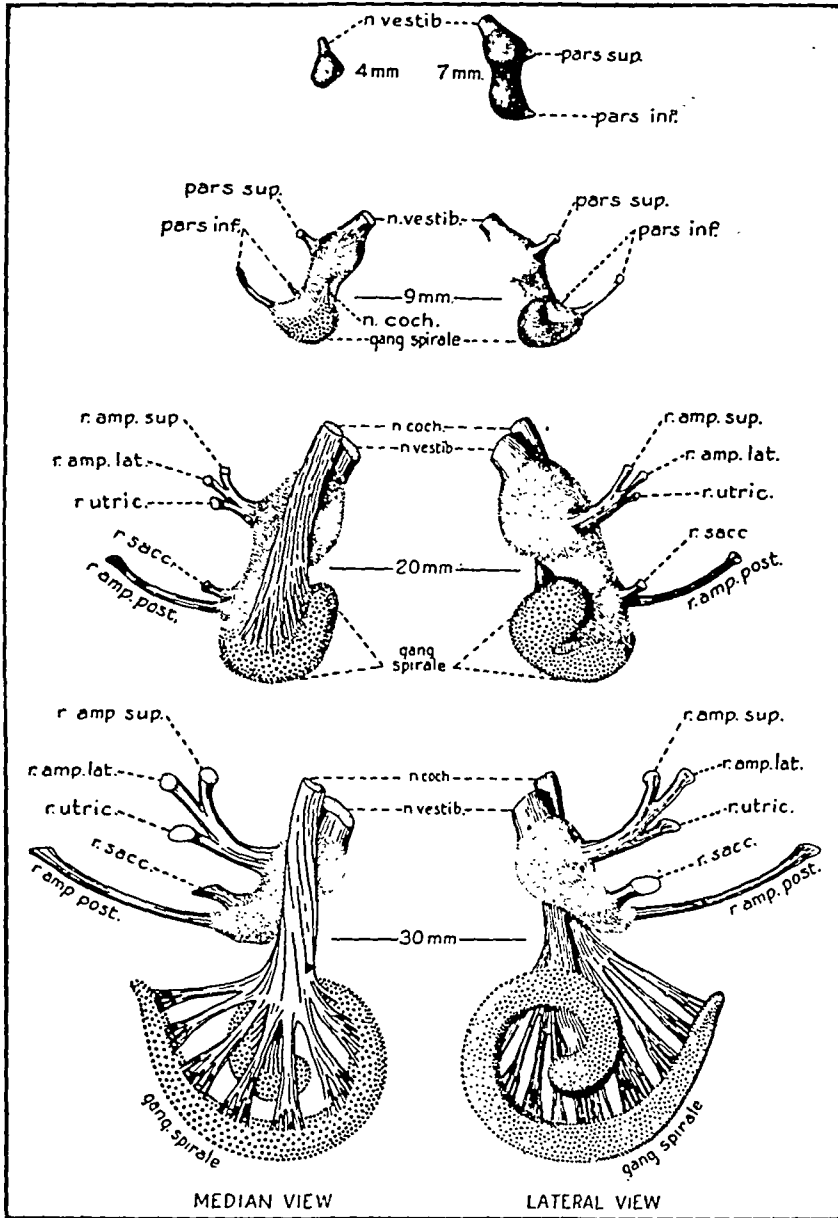


Fig. 1.—Stages in the differentiation of the acoustic nerve complex. Vestibular ganglion shown by fine dots, and spiral ganglion by large dots. (After Prof. G. S. Streeter). Illustrates the development of the vestibular and cochlear portions of the auditory nerve.

With Doctor McGregor's help an auditory nerve was exposed in its bony canal. The vestibular and cochlear fibres were easily identified as separate bundles close to the cochlea and semicircular canals. The vestibular portion could be traced medially, and at the internal auditory meatus it made up the cephalad and dorsal half of the auditory nerve, with the patient in the prone position. More medially still the vestibular fibres become ventral, whether by twisting or interlacing or a combination of both I am not sure. For our present purpose it is the relationship close to the internal auditory meatus that concerns us.

On microscopic examination the vestibular nerve shows a very much better defined picture of medullated nerve fibres (Figs. 2 and 3), the fibres are larger and have a thicker medullary sheath. The difference is sufficiently definite to enable one to examine the cross section of an auditory nerve and immediately pick out the vestibular half, that is, if the section is taken close to the internal auditory meatus. Further studies are required on the mesial portion. Close to the internal auditory meatus, when one attempts to split the nerve at operation, a line of cleavage or groove is occasionally seen, but on microscopic examination there is an absence of a fibrous septum dividing the two nerves. On one occasion Dandy¹ observed a complete separation of the cochlear and vestibular fibres. Numerous attempts have been made in the autopsy room to divide the nerve into cochlear and vestibular portions. Microscopic study of these specimens has always shown an intermingling of the fibres along the line of division, thus it is not possible to accurately split the nerve in a microscopic sense. However, our studies show that division can be sufficiently accurate for the present clinical purpose.

At operation exposure is obtained through a unilateral cerebellar approach, made as high and lateral as the lateral sinus and mastoid cells will permit (Fig. 4). If the nerve is approached from below because of deficient bone removal in the upper and lateral angle of the field, the operation is more difficult. With a straight knife a short incision is made into the centre of the nerve parallel to the fibres and close to the internal auditory meatus, this incision need not go through the nerve, but it approximately divides the nerve into its vestibular and cochlear portions (Fig. 4A). The vestibular portion is then isolated by passing a blunt right angled

hook over the cephalad and dorsal half of the nerve (Fig. 4B). The point of the hook at all times must be kept closely approximated to the ventral surface of the nerve, to avoid any possibility of picking up the facial nerve or a large vessel. It is usually possible to avoid a small artery running in the nerve, as in our cases it has been on the cochlear side of the longitudinal incision. The vestibular fibres are quite tough, and the cochlear fibres may be damaged if one attempts to divide the bundle by tugging with a hook or hook-knife; it is advisable to cut down on the hook with a straight knife (Fig. 4C). When division of the vestibular fibres is completed the facial nerve comes into view and need not be disturbed in any way (Fig. 4D). It is not necessary to isolate the seventh nerve as a preliminary step and thus run the risk of injuring it, and in this respect the operation is

much easier than division of the whole nerve. Care should be taken to see that the hook hugs the nerve until it breaks through the longitudinal cut. In none of our cases has there been the slightest indication of injury to the facial nerve. If one should ever wish to divide the nerve of Wrisberg alone a very satisfactory and accurate exposure could be obtained by first dividing the vestibular portion of the auditory nerve as described.

PATHOLOGY

The situation and nature of the pathological lesion in the group of cases under discussion is unknown. The cure of the attacks by section of the vestibular nerve may be because abnormal impulses are prevented from reaching the brain, or it may be because normal impulses are prevented from reaching abnormal pathways or

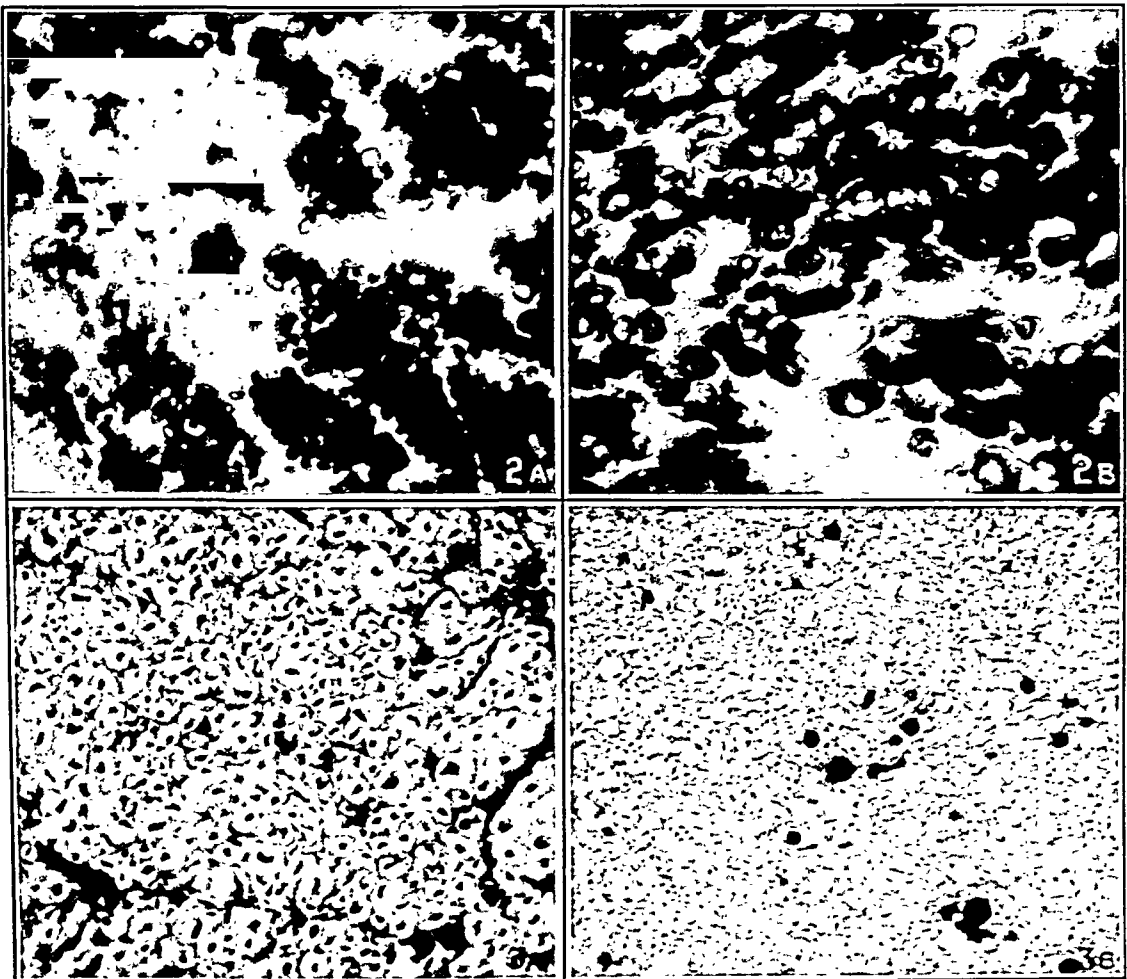


Fig. 2. A and B.—Weigert preparation. Vestibular fibres on the right, cochlear fibres on the left; equal magnification. Note the marked difference in the size of the fibres. Fig. 3. A and B.—Hematoxylin and eosin preparation. Vestibular fibres on the left; cochlear fibres on the right; equal magnification. Note the marked difference in size of the fibres.

Sketches Illustrating Technical Steps
in Dividing the Vestibular Portion of
the Auditory Nerve on the Right Side.

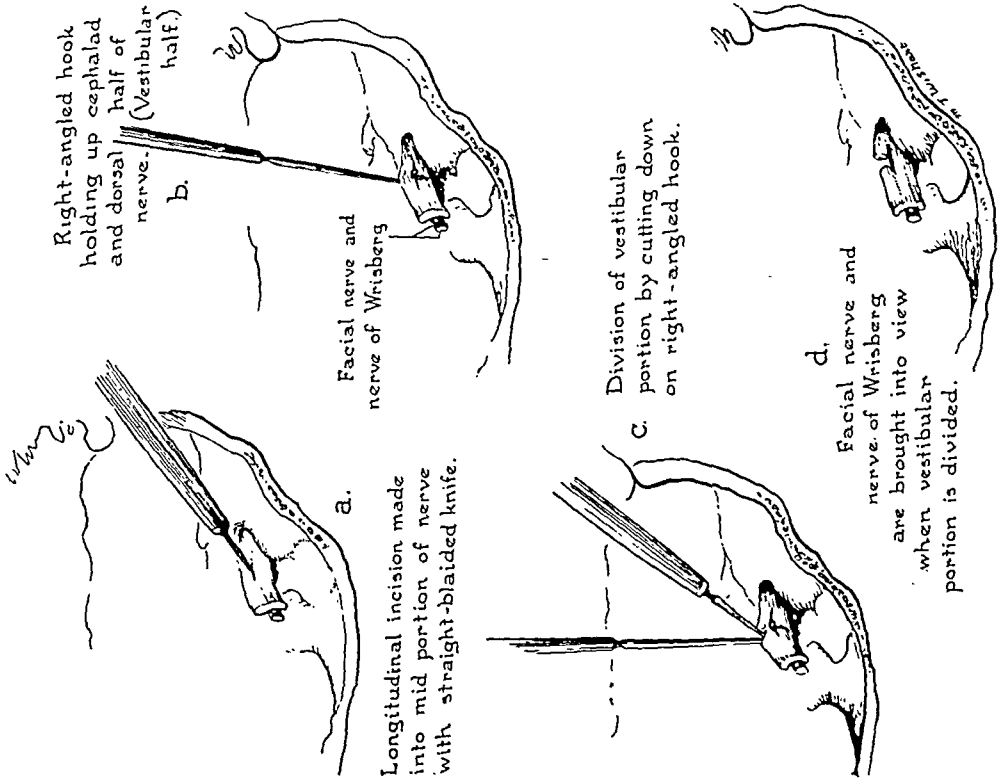


Fig. 4

centres in the brain. One assumes that the lesion which causes the tinnitus also causes the vertigo. As many of these patients go on to complete unilateral deafness the lesion cannot be in the cortex of the brain. Also one might argue that the lesion is not in the cochlea or vestibular canals as Dandy¹ and Coleman² found that tinnitus persisted in many of their patients after complete section of the nerve. Anatomically, a single small lesion could hardly affect both the cochlear and vestibular apparatus in the brain-stem.

relationship with the artery close to the brain-stem and not be seen at operation.

Professor Watt,⁷ of the Anatomical Department at the University of Toronto, is publishing a paper describing the great variability in the relationship of the anterior inferior cerebellar artery to the auditory nerve. I suggest also that this relationship of artery to nerve may account for nerve deafness in some patients, especially in older individuals where the artery may be thickened and stiff from arteriosclerosis. The auditory artery itself also shows great variation,

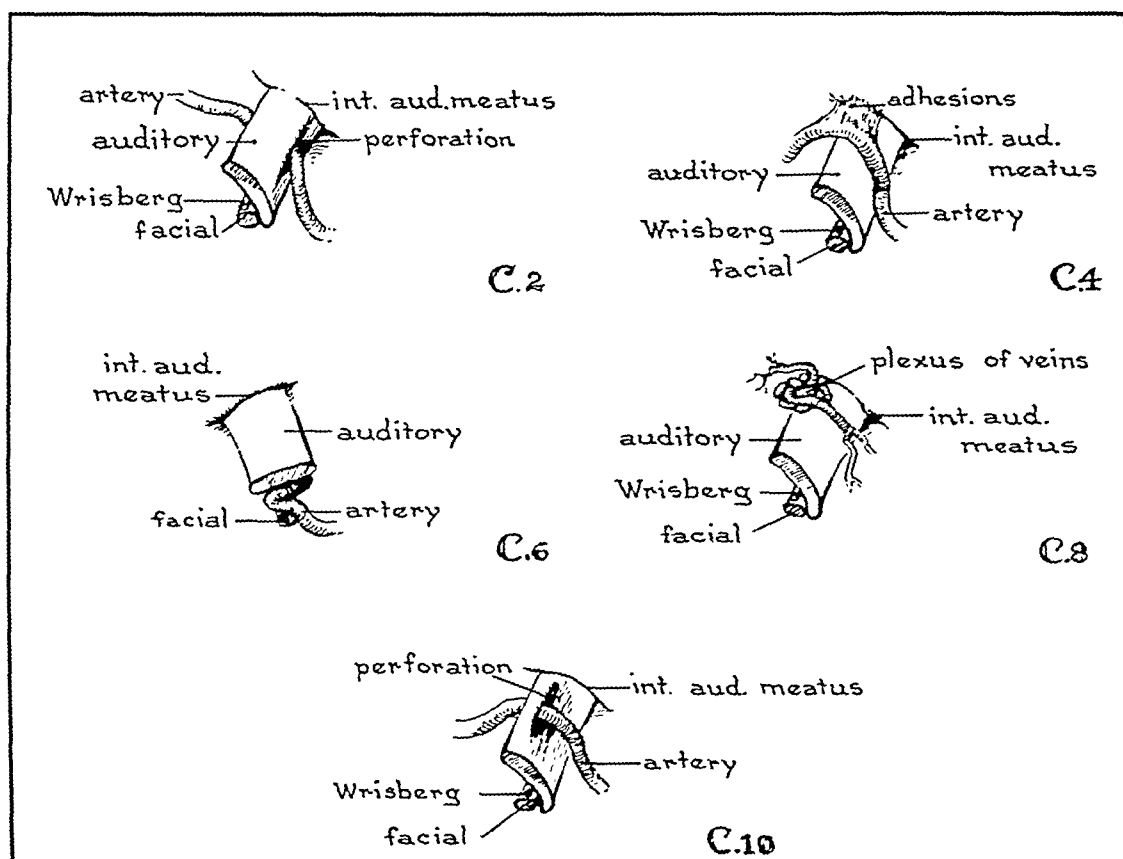


Fig. 5.—Diagrams from operator's notes and sketches illustrating the vascular abnormalities encountered in five of the twelve cases. In each instance the artery was considered to be the anterior inferior cerebellar.

The lesion if it is in the nerve itself does not cause a microscopic change (Case 8). I suggest that some consideration be given to the theory that an abnormal relationship of the anterior inferior cerebellar artery to the nerve may be an etiological factor. In Cases 2, 4, 6, and 10, such an artery was seen at operation. In Case 8, there was a large vein in direct contact with the nerve (Fig. 5). These observations have not been supported by Dandy, Cairns or Coleman, but the nerve could have an abnormal

so that the blood supply of the nerve itself may be jeopardized in certain individuals.

LATERALIZING SIGNS

In the group of cases under discussion in this paper there has been no difficulty in deciding on which side to operate. All of the patients with the exception of No. 7 had definite unilateral tinnitus associated with diminution of hearing on the side operated upon. In No. 7 there was some doubt, but the side on which

the loss of hearing was most marked was operated upon and so far there has been no recurrence of attacks.

The caloric response has been of no value as a lateralizing sign in this group. Taken as a whole, the reactions had a tendency to be hypoactive without definite difference on the two sides.

One would naturally think that the type of nystagmus would be a valuable lateralizing sign in these cases. I have notes on 5 patients in whom nystagmus was observed. In 3 the nystagmus was most marked on looking to the side of the lesion (Cases 1, 2 and 10, personally observed). In Case 12, observed by a competent house-surgeon, the nystagmus was seen when the patient looked away from the involved side. The fifth patient was personally observed during an attack. She has not been operated upon, but had definite unilateral tinnitus and deafness. The nystagmus was definite on looking away from the involved side; with the eyes at rest the quick component was also away from the involved side. Hence in these five patients the nystagmus had no lateralizing value. Furthermore, the nystagmus may not always be the same in one patient. McKenzie^s quotes the case of a doctor who observed nystagmus on himself on frequent occasions during attacks. He found that there was great variation in different attacks.

The direction in which objects move is also of little lateralizing value. Seven out of the 12 patients discussed in this paper were unable to state that objects moved in any definite direction. In 3 objects moved towards the side of the lesion, and in 2, away from the side of the lesion. In 2 other patients, not operated upon, objects moved toward the involved side.

Most of the patients preferred to lie on their backs. One was very certain that he could only lie on the affected side, while a second patient was just as emphatic that he could only lie on the good ear.

SELECTION OF PATIENTS SUITABLE FOR OPERATION

Normal equilibrium is maintained by impulses from the internal ear, eyes, skin, joints and muscles. Abnormalities in some of these impulses will produce marked vertigo. Irritation of the semicircular canals from an acute or chronic middle ear disease is a common cause; occasionally impacted wax or an obstructed eustachian tube may cause severe vertigo. Tu-

mours and aneurysms are quoted as examples of intracranial lesions which may upset the vestibular pathways, although I have never seen severe attacks of vertigo associated with an acoustic neuroma. Less perfectly understood cases are apparently associated with local foci of infection, arteriosclerosis, etc., which affect the vestibular apparatus in some unknown way. There remains, however, a small group of patients who suffer from attacks of vertigo, without disturbed impulses from the eyes, without disease of the middle ear, without demonstrable foci of infection, arteriosclerosis or an intracranial lesion.

Many of these patients will make satisfactory progress with re-assurance and mild sedative drugs, such as luminal. There is a tendency towards spontaneous cure. For instance, a doctor, aged 40, tells me that he had a series of typical attacks over a period of four months; since then five years have elapsed and he has remained perfectly well. He has had no special treatment and no cause for the attacks could be found. Recently another doctor consulted me who has had four attacks during the past year. The disability is not great if they do not increase, and in time they will disappear. I have the histories of some 15 such cases who have not sufficient disability to justify an operation.

The patients we have operated upon had all had very severe and frequent attacks; they had lost their morale and in many instances had had to give up work. All were examined carefully by competent ear, nose and throat specialists and internists, but they had been unable to obtain relief.

Furstenberg^s has recently stimulated interest in the medical treatment of these patients. He states: "Apparently the local tissues involved in Ménière's disease have either an increased avidity for sodium or an unusual sensitivity to it". We have only had the opportunity of applying his treatment in one patient (Case 12). In this patient we failed to produce an attack with sodium chloride, and while the patient was taking ammonium chloride he had the most severe attack he had ever experienced. Furstenberg's results have been so striking, however, that we hope to have the opportunity of treating further cases by this method. To estimate the value of this treatment it will be necessary to select patients who are having frequent severe attacks, similar to the type of case outlined in

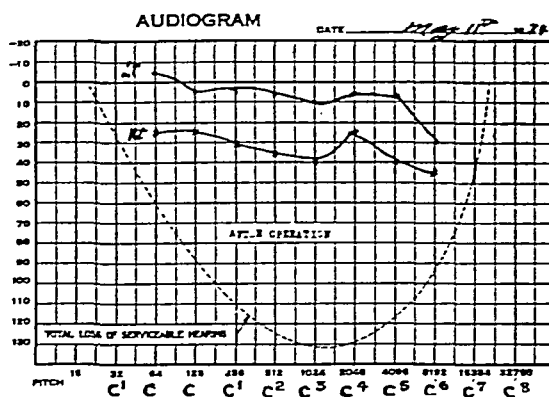
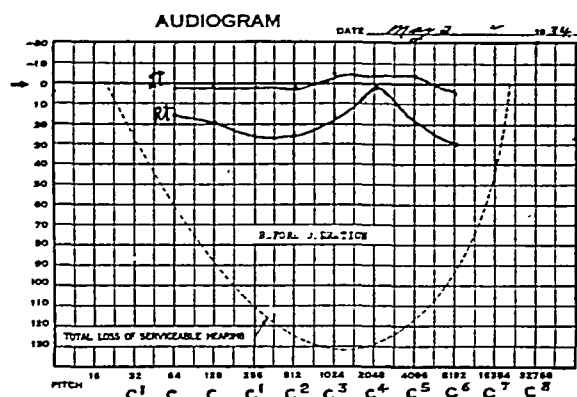


CHART I

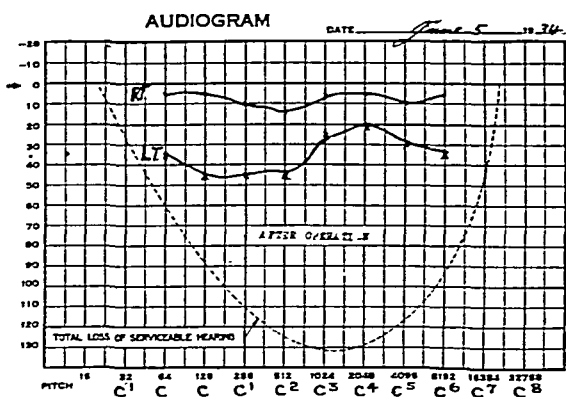
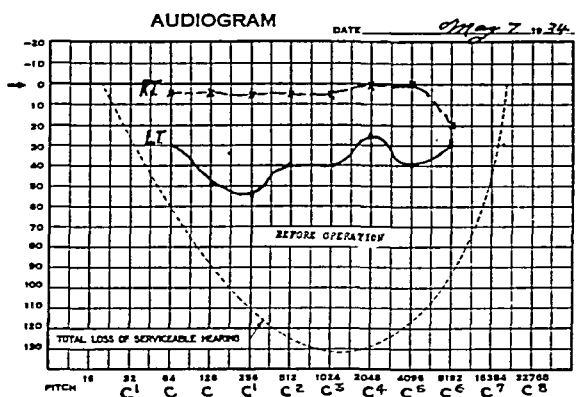


CHART II

Chart I. (CASE 10).—Section of right vestibular nerve. The audiograms before and after operation are practically identical. At the time of the last examination, seven months after operation, hearing was practically the same as previous to the operation.

Hearing Test: Left			Right	
25' +	S. Voice		25' +	
25' +	Whisper		22'	
.5	High Limit	.5		
	(Galton W.)			
32	Low Limit	32 (shortened)		
55	Rinné (256)	35		
20		15		
+	Weber (128)	+		

Caloric not done before operation because of patient's condition.

Hearing Test: Left			Right	
25' +	S. Voice		25' +	
25' +	Whisper		24'	
.5	High Limit	.5		
	(Galton W.)			
32	Low Limit	32 (shortened)		
60	Rinné (256)	30		
25		14		
+	Weber (128)	+		

Caloric test: Right ear: Water 64° F. douche 3 min.—No reaction. Water 52° F. douche 5½ min.—There was no nystagmus, no vertigo, no past-pointing or falling with head either forward or backward after 5½ min. No reaction present in right labyrinth.

Chart II. (CASE 11).—Section of left vestibular nerve on May 7, 1934. The audiograms before and after operation are practically identical. Caloric response was abolished. At the last examination, seven months after operation, hearing was unchanged.

Hearing Loss	Average	Hearing Loss	Average
Right Ear.....		Right Ear.....	
Left Ear.....		Left Ear.....	

Hearing Tests:			Hearing Tests:	
Right Ear	Left Ear		Right Ear	Left Ear
25' +	Spoken Voice	25' +	25' +	Spoken Voice
25' +	Whisper	22'	25' +	Whisper
.5	High Limit	.5	.5	High Limit
	(Galton W.)			(Galton W.)
32	Low Limit	128 (short) (No. 64 Fork)	32	Low Limit
60	Rinné (256)	15	55	Rinné (256)
30		35	28	
++	Weber (128)	+	++	Weber (128)

Both labyrinths react to the caloric tests but they are hypo-active.

June 5, 1934. Hearing Tests:			Hearing Tests:	
Right Ear	Left Ear		Right Ear	Left Ear
25' +	Spoken Voice	25' +	25' +	Spoken Voice
25' +	Whisper	24'	25' +	Whisper
.5	High Limit	.5	.5	High Limit
	(Galton W.)			(Galton W.)
32	Low Limit	128 (short) (No. 64 Fork)	32	Low Limit
55	Rinné (256)	18	55	Rinné (256)
28		35	28	
++	Weber (128)	+	++	Weber (128)

Caloric Test: Left ear: Water at 60° F. douched 6 min. With head forward 35 there was no nystagmus, vertigo or falling with head backwards, forward 35 or bent over. Test repeated with water at 54° F. douched 4 min. There was no nystagmus or vertigo with head backwards, forward or bent over. No reaction to caloric test present in left labyrinth.

the twelve histories in this paper. For the most part our patients have been so situated that it was impossible for them to carry out a dietetic régime such as advocated by Furstenberg.

SUMMARY OF RESULTS

Twelve patients have been operated upon between September, 1931, and July, 1934. One patient (Case 9) died from a wound infection eleven days after operation. Apart from this unfortunate mishap, the results obtained in the remaining 11 have been very satisfactory. They are all extremely grateful for the relief which

plete cessation of tinnitus, 2 were unchanged, and in the other 5 there has been a marked diminution. Some of these patients state that it is growing less and less, so that it may ultimately disappear. Coleman found persistence of tinnitus in a mild form in 5 out of 10 of his patients, and Dandy in 6 out of 9 of his patients. In these cases the nerve had been completely sectioned. It is certain that the tinnitus which has been persistent in 5 of our 9 cases of vestibular section has been modified to such an extent that this operation can be undertaken with the expectation that the symptom will be alleviated

TABLE
THOMAS TREGELLAS. SECTION OF RIGHT VESTIBULAR NERVE

	Right			Left		
	July 24, 1932	Oct. 31, 1932	Nov. 20, 1933	July 24, 1932	Oct. 31, 1932	Nov. 20, 1933
	Before Operation	After Operation	After Operation	Before Operation	After Operation	After Operation
Whisper	3 feet	5 feet	20 feet	6 feet	20 feet	21 feet plus
Mov. Voice	12 feet	21 feet		24 feet		
Low Limit	C 128-	C 128-	C 32 barely heard	C 32	C 32	C 32 heard well
High Tone	C 2048-	C 2048	C 2048	C 2048	C 2048	C 2048
Galton....			Slightly better high ranges	Slightly better	Slightly better	Slightly better
Rinné.....	BC decreased	Positive 25		Positive	Positive 90	Positive
	BC ₂ AC	15			25	
Weber....				To left	To left	
E. Tube...	Clear	Clear		Clear	Clear	
Inflation...	No improvement	No improvement		No improvement	No improvement	
			Caloric—	Water at 64° F.		
Nystagmus	Plus 1 min.15 sec.	Neg. 5 minutes	Negative	Plus 1 minute	Plus 1 min.40 sec.	
Vertigo....	Plus	Negative	Negative	Plus	Plus	
Falling....	Plus to right	Negative	Negative	Plus to left	Plus to left	
Head back.	Plus	Negative	Negative	Plus	Plus	

CASE 2.—Section of right vestibular nerve, July, 1932. On Dec. 20, 1934, hearing was not diminishing, still able to hear low voice at 20 feet, with noise box in good ear. Caloric response abolished on side operated on.

they have obtained, and although the post-operative period is short, varying from three years and five months to five months, one has no reason to anticipate a return of attacks.

For a few weeks or months there has been a moderate degree of unsteadiness. This gradually disappears, the patients become confident and cheerful and quite certain of their balance. Occasionally, on turning quickly in the dark, there is a slight tendency to fall to the affected side.

The effect of vestibular section on tinnitus is extremely interesting. Of 12 patients one did not have tinnitus before operation; of the other 11, one died, one had a complete section, leaving 9 for consideration. Two of these have had com-

almost to the same extent as after complete section of the nerve.

With two exceptions, all of the patients had an absence of the caloric response after operation. In Cases 4 and 6 there was some slight reaction from the vertical canals. These patients have remained free of attacks, and this observation suggests that it is not necessary to cut all of the vestibular fibres to cure a patient. Dandy¹⁰ has made the interesting observation that hearing is not interfered with in cases where he has presumably cut all of the vestibular fibres and a portion of the cochlear fibres. The fact that some of the vestibular fibres can be left is of some technical importance, as it enables one to avoid a small artery which is usually seen

running approximately in the centre of the nerve.

Of the 12 patients 7 had such poor hearing on the affected side that it was of little importance to save the cochlear fibres. In each instance, however, the hearing which they did have was not impaired by the operation and they have remained free of attacks. The remaining 5 patients had useful hearing, but unfortunately two failures occurred in this group. One patient died suddenly from a wound infection eleven days after operation; in the second case the cochlear fibres were unintentionally cut.

The following records of hearing before and after operation on the other three patients with good hearing illustrate the value of this operative procedure when it is desirable to save the cochlear fibres (Charts I, II and the Table). I have had a hope that hearing would not continue to diminish in these patients if the attacks of vertigo were stopped. It will take some years and more patients to determine this point, but the records show that hearing is being maintained on the involved side.

CONCLUSION

It is possible to section the vestibular portion of the auditory nerve without interfering with the function of the cochlear fibres. This procedure cures patients who are suffering from severe and disabling attacks of vertigo. The operation should be reserved for selected cases which do not respond to other therapeutic measures.

The author is especially indebted to Dr. Gregor McGregor, of the Ear, Nose and Throat Department at the Toronto General Hospital, for his careful examinations on most of the patients, and also for his help in working out the relationship of the cochlear and vestibular fibres at their exit from the internal auditory meatus; to Dr. A. M. McLeod, of the same Department, who also examined several of the patients; and to Prof. E. Linell who assisted in the interpretation of the microscopic preparations.

CASE 1

Mrs. J.D., aged 51, was admitted to hospital in August, 1931. She last felt perfectly well twelve months previously. While working at the stove she turned quickly and suddenly fell to the floor. Objects in the room seemed to be tumbling on top of her; she was able to crawl to a couch to lie down where she stayed for an hour or so. She was then able to get up and felt fairly well, apart from a full feeling in her ears. About a month later she noticed a continuous buzzing in the right ear, and from that time hearing has been progressively impaired on the right side. These severe attacks of vertigo, brought on by turning quickly, occurred at frequent intervals, usually every couple of weeks. The patient could give no clear description of objects turning. She would fall suddenly as though thrown out of a gun, and felt as though her head were rising up and the house falling down. During an attack she preferred to lie on

the left side. Between attacks she never felt quite well, slightly "sea-sick" all the time. On one occasion shortly after an attack there was nystagmus on looking to the right but none on looking to the left; when at rest the eyes slowly drifted to the right. There was seldom any vomiting during an attack.

A careful, physical, laboratory and ear, nose and throat examination failed to disclose any abnormal findings, apart from marked nerve deafness in the right ear. The caloric response was normal.

Operation.—September 3, 1931. SECTION OF THE VESTIBULAR PORTION OF THE RIGHT AUDITORY NERVE.

Following operation there was definite nystagmus on looking to the left; this had practically disappeared in ten days. The caloric response was absent on the side of the operation. Hearing was very badly impaired but was thought to be unchanged. On December 1, 1933, the patient wrote as follows:

"There have been no more dizzy attacks, for which I am very grateful. In regard to the noise in the ear, this has not disappeared or diminished; it is a constant beat but it does not worry me."

CASE 2

Mr. T., aged 40, was referred in July, 1932, by Dr. Holme with a diagnosis of Ménière's disease. One year previously the patient was sitting in an automobile. He had occasion to turn his head quickly to the right, after which he fell over to the right and felt faint for a few seconds. A week later a similar attack occurred. He was quite well then until last autumn, when he first noticed a singing noise in his right ear with slight deafness. These symptoms of deafness and tinnitus remained constant ever since that time, varying greatly in intensity from day to day, at times hardly noticeable, and at other times very bothersome.

Five weeks before being seen by me the patient woke up one morning very nauseated, extremely dizzy, perspiring profusely, and suffering from diarrhoea. He could not stand up because of dizziness. He felt as though he were continually falling, and had to go to the bathroom on his hands and knees. This vertigo lasted about one-half hour, after which the patient felt perfectly well. The day afterwards he returned to work. Two days later he had another attack, lasting about half an hour during which time he felt nauseated. He felt that he was falling downwards and to the right. Since that time, there had been six similar attacks. They were not associated with vomiting, although he was usually nauseated. With the last five spells, patient had been always able to jump immediately into bed. While in bed, he felt that he had to hang on to the sides to prevent himself from falling. He said that he was terrified at the thought of going back to work and having an attack when he was out on the street.

The patient was admitted to hospital for a period of two weeks for observation and study before operation. During this period he had several more typical attacks, during which nystagmus was observed when he looked to the right. Physical and routine laboratory examinations of the blood and urine were negative. The blood Wassermann was negative. An examination of the accessory nasal sinuses was negative. There was no history or evidence of inflammatory ear disease.

Operation.—July 25, 1932. DIVISION OF THE VESTIBULAR PORTION OF THE RIGHT AUDITORY NERVE.

Through a unilateral cerebellar approach the vestibular portion of the right eighth nerve was divided.

Immediately after the operation there was no nausea or complaint of dizziness. On first getting up he said that he felt light-headed and there was a slight tendency to stagger to the side of the operation. A slight, fine nystagmus persisted for about a week, the quick component being to the side opposite the lesion. Con-

valescence continued to be uneventful and the patient returned to work in four weeks. The ultimate outcome has been highly satisfactory; from a man who had lost his morale he was transformed into a cheerful and grateful patient who has continued to work free from disability.

One very interesting and important observation, in view of the fact that the cochlear fibres were not divided, is that the constant singing noise present before operation gradually disappeared and there has been complete alleviation from this symptom for at least a year.

CASE 3

Mr. C., aged 40, entered hospital on December 20, 1932. He had been in his usual good health until June, 1932. One evening while at work he became suddenly dizzy, with a terrible buzzing sensation in his left ear; everything appeared to be moving from right to left. He attempted to put away his books but could scarcely walk. With great difficulty he managed to get to the bathroom where he vomited profusely. He apparently then lost consciousness as he remembered nothing further until he awakened the following morning, when he felt well except for weakness, some headache, and moderate ringing in his ears. Since that time he had had fifteen to twenty similar attacks, but had not lost consciousness. The Wassermann test, and routine laboratory and neurological examinations were negative. There were no foci of infection in the teeth or sinuses. This patient had good hearing on both sides, the left not quite so good as the right. Caloric tests were normal and essentially the same. Routine examination of the nasal pharynx, sinuses and ears was negative, apart from some large boggy turbinates and some dullness of the left ear drum as compared to the right.

Operation.—December 23, 1932. COMPLETE SECTION OF THE LEFT AUDITORY NERVE.

An attempt was made to divide the vestibular portion of the left nerve, but through a technical error the whole nerve was severed.

When the patient regained consciousness there was no complaint of dizziness. The day after the operation there was nystagmus on looking straight ahead with the quick component to the right; this nystagmus gradually disappeared during the course of the following week; no complaint of double vision. There was no facial weakness. Deafness was complete in the left ear. On April 25, 1933, the patient stated that he never felt better; he was working, very happy; no unsteadiness, no nystagmus. The ringing in the ear which used to come on prior to an attack, and which warned the patient that an attack was coming on, had not recurred. February 10, 1934, the patient has remained perfectly well; no noise in the ear and no suggestion of attack. He is a very grateful patient.

CASE 4

Mrs. D., aged 43, entered hospital on June 5, 1933. She was apparently perfectly well until two years before, when she began to have an occasional dizzy spell accompanied by vomiting. The first year she had five spells, which were not specially severe; she would lie down for an hour or so, have a sleep, and then be able to carry on. About the time the first spells commenced the patient was aware of a singing noise in the right ear; this was not bothersome except for a short period before a spell, when it became very loud. During these earlier spells the patient could not recall that objects moved in any special direction. About ten days before admission she had her first really severe spell. Shortly after breakfast objects suddenly started to go around, moving from left to right. She lay down on the ground on her right side, commenced to vomit, and found that she was much more comfortable lying on the right side. After one and one-half hours she was helped to bed. From this first severe spell until the time of record she had been almost continuously dizzy and had had to lie down almost con-

tinuously, preferably on the right side. On examination when she was admitted to hospital there was no nystagmus. Neurological examination was negative. There were no foci of infection in the sinuses or teeth. The Wassermann test and routine laboratory examinations were negative. There was no useful hearing on the right side (deafness of the mixed type); a moderate degree of deafness on the left. The right ear drum was dull as compared with the left. Caloric reaction.—There was a definite response on both sides, but delayed particularly on the right. The reaction was obtained in two and three-quarters minutes on the left and four and one-half minutes on the right.

Operation.—June 6, 1933. DIVISION OF THE VESTIBULAR PORTION OF THE RIGHT AUDITORY NERVE.

A satisfactory view of the nerve was obtained; there was no line of cleavage. The upper and anterior half of the nerve was hooked up and divided; the motor portion of the seventh was identified, but not the nerve of Wrisberg. There were no adhesions about the nerve and no vessels were seen.

On recovering from the anæsthetic there was no dizziness. A hissing noise in the ear, which had been present before operation, had practically disappeared at the end of seven days; there was no complaint of double vision. Fine nystagmus was present, most marked on looking to the left; this disappeared at the end of a week. Ten days after operation there was slight reduction in the hearing on the right as compared to the finding before operation. Caloric test.—This test was difficult to carry out and interpret because of the short period since operation. There was a suggestion that a few vestibular fibres had been left from the vertical canals. It was impossible to get the patient back for a more accurate test.

April, 1934. The patient stated that she had had no more dizzy spells and was feeling very well. The noise in her ear, which had been present before operation, had disappeared.

CASE 5

Mr. S., aged 58, entered hospital on July 3, 1933. About six years before he had noticed a buzzing noise in the left ear; two months later he had his first attack while driving a truck. Objects commenced to move rapidly in every direction, buildings seemed to go around in circles in various directions, and his truck seemed to go up and down. He was able to stop the truck, get out, and lie on the ground with his eyes closed, but still felt as though everything were moving about him. He had to be helped home and vomited profusely; he was feeling considerably better in three or four hours. These attacks were repeated with varying severity every two or three weeks during the first few years. Lately, he had had as many as three or four attacks in one week. He had noticed that the buzzing in the ear was always more marked just before an attack. He did not vomit in all of the attacks. He never lost consciousness, but was unable to give a clear description as to the direction in which objects moved; he was never observed during an attack with regard to the nystagmus. Routine laboratory and Wassermann tests were negative. No foci of infection were discovered. Neurological examination was negative, except for the fact that when the patient was standing with his eyes closed there was a tendency to fall to the left.

February 4, 1932. Marked deafness on the left with no useful hearing; considerable diminution of hearing on the right, of a mixed type. Caloric test.—Reactions were obtained in one minute and twenty seconds on each side but were not severe in any instance, and water at forty degrees did not materially increase the action obtained with water at sixty degrees.

July 10, 1933. No material change in hearing. Caloric test.—Less sensitive to stimulation than on the first test; there was very little response until ice-water

was used; then the response was slight, with no difference in the two sides.

Operation.—July 11, 1933. DIVISION OF THE VESTIBULAR PORTION OF THE LEFT AUDITORY NERVE.

There was no special point in sectioning only the vestibular portion of the nerve in this case, as the patient was practically deaf in the left ear. However, tinnitus had been a very marked feature and I was anxious to see if section of the vestibular portion of the nerve alone had any definite effect on this complaint. In previous cases I had gained the impression that the tinnitus was very definitely modified, even though only the vestibular portion of the nerve had been cut. Satisfactory exposure was obtained; there was no line of cleavage. The upper and anterior half of the nerve was cut, without trauma to the remaining portion; the seventh nerve was clearly seen; there were no adhesions or large vessels in contact with the nerve.

July 13, 1933. No double vision even on looking to the extreme right and left; nystagmus quite marked on looking to the right; looking straight ahead there was a fine quick nystagmus, the eyes being jerked to the right and drifting back to the left; no dizziness; buzzing in the ear was definitely less.

September 18, 1933. The noise in the ear was not nearly so marked; occasionally before a rain it became more marked but never really bothered him. There had been no suggestion of recurrence of attacks and the patient was very grateful for the relief he had obtained. With his eyes open co-ordination appeared to be perfect, but with eyes closed there was a tendency to fall to the left; he had noticed that in the dark he was somewhat unsteady and tended to go to the left. Hearing practically as before operation. Caloric test was entirely absent on the right side.

CASE 6

Mrs. W., aged 36. About ten years before this patient noticed a singing noise in the left ear. This was fairly constant but had always been greatly exaggerated just before an attack and gave her warning that an attack was coming on. About eight years before she noticed deafness in the left ear while using the telephone. The first attack of vertigo occurred about five years ago. While coming down in an elevator she felt light-headed and dizzy, but was able to walk a few blocks to her place of business. While sitting at her desk she suddenly became more dizzy and felt as though her head were leaving her shoulders. This feeling had been present at the start of most of her severe attacks. She was able to stagger to the wash-room, where she vomited profusely, was taken home, and was able to return to work the following day, although feeling weak. Attacks similar to this first attack occurred at varying intervals of three to four months up until six months previous to admission, when the attacks became much more frequent (as often as three in a week) so that when she was admitted to hospital she had had to give up her business, and even between severe attacks she felt constantly dizzy and "sea-sick". The patient was not able to give a very coherent story with regard to her sensations during attacks. Often before an attack something seemed to snap in the back of her head, but more frequently she had the feeling as though her head were leaving her shoulders. On a few occasions she knew that objects were moving from left to right. For the most part she kept her eyes closed during an attack and preferred to lie on her back; there was no tendency to roll to one side; she never lost consciousness. She had found lately that any sudden movement made her feel somewhat nauseated and was apt to precipitate an attack. Routine laboratory, Wassermann and neurological examinations were negative. No foci of infection.

October 31, 1933. Marked impairment of hearing on the left; no useful hearing. Moderate impairment of hearing on right. Deafness of mixed type. Caloric

test.—Both sides react about the same; both a little sluggish.

Operation.—November 22, 1933. DIVISION OF THE VESTIBULAR PORTION OF THE LEFT AUDITORY NERVE.

There was no line of cleavage. The upper anterior two-thirds of the nerve were divided in this case. There was a good-sized artery which made a loop between the eighth nerve and the seventh; one could easily have picked up this vessel and divided it. Two days later the patient stated that objects appeared double when she looked to the extreme right; on looking straight ahead there was a fine nystagmus, with the quick jerk to the right; there was no double vision on looking to the left. This nystagmus and double vision gradually disappeared during the following week. The patient made an uneventful recovery.

February 28, 1934. Feeling and looking well, happy, no recurrence of attacks. There was a slight hissing noise in the ear which did not bother her; no exaggeration of the sound, as there was before operation, just preceding each of her attacks. She felt that there was some unsteadiness in her gait but this was not apparent. She could hear better in the right ear because of the diminution of the noise in the left. She had returned to work.

March 6, 1934. Slight reduction of impaired hearing on left since operation. Caloric test.—Reaction on the right, normal; slight response on the left from the vertical canals only.

CASE 7

Miss C., aged 68, entered hospital on December 4, 1933. Fourteen years before this patient had had spinal meningitis, with numerous convulsions. At this time she apparently made a complete recovery. Six years before admission she developed a pain in her left ear. After a few days the drum was incised but there was no discharge. Six months later she had her first attack of vertigo; she felt as though she had been struck on the top of the head and knocked to the floor. She was able to crawl to the telephone and call for help, but had to be lifted into bed. She noticed that objects were moving in every direction; she herself appeared to be swinging about in every direction, even while lying in bed. The severe vertigo subsided after a few minutes and was followed by severe vomiting which lasted almost a day. She remained in bed for several weeks, suffering from weakness and general prostration. The patient had had many similar attacks at varying intervals from one to six months up to the present time. In the letter which she wrote just before being admitted to hospital she stated that the attacks were so severe and becoming so frequent that death was preferable to her existing condition. During the six years there had been steadily progressive deafness in both ears, more marked in the left; there had been no tinnitus. Routine laboratory, Wassermann and neurological examinations were negative. There were no foci of infection. Blood pressure 130/80. She was practically completely deaf on the left side, with marked impairment on the right. Caloric test.—Response normal, with a slightly more marked reaction on the right, probably not beyond technical error.

Operation.—December 12, 1933. SECTION OF THE VESTIBULAR PORTION OF THE LEFT AUDITORY NERVE.

In this case a line of demarcation could be seen between the vestibular and cochlear portions. The vestibular portion was hooked up and cleanly divided, and the nerve of Wrisberg and the motor portion of the seventh clearly seen. There were no adhesions or vessels adjacent to the nerve.

For about a week after the operation the patient had a fine nystagmus on looking straight ahead. This was somewhat rotary, with the quick component to the right. Convalescence was delayed in this patient as she

developed a chest infection. Caloric response was absent on left side.

March 20, 1934. A letter received from the patient expressing her gratitude for the relief which she had obtained. There had been no suggestion of a return of severe seizures, but she was still complaining, however, of some mild unsteadiness and numbness of the back of the head.

CASE 8

Mr. B., aged 51 years. This patient had been perfectly well until May, 1929, when he had his first attack of severe vertigo ushered in by sharp pain above the right ear; the pain lasted about one hour. Buzzing and pain always preceded an attack, so that the patient always knew it was coming. He would lie down. Objects appeared to move upwards towards the ceiling, and always moved this way, no matter which side he lay on. He eventually vomited. The attack lasted altogether an hour or so. In some attacks he partially lost consciousness. The attacks came on about once a week. There had been increasing deafness in the right ear for the previous one and one-half years. Between attacks he was perfectly well. The Wassermann, routine laboratory examinations negative; no foci of infection.

Examination by Dr. McGregor. — Degenerative changes present in both drums, more marked on right; no useful hearing, right; marked impairment, left.

Caloric test.—Marked reactions, equal in intensity, but when the right ear was stimulated the patient experienced a sensation of going up in an elevator, much like his attacks. When the left ear was stimulated he had a sensation of going round and round.

Operation.—March 22, 1934. DIVISION OF VESTIBULAR PORTION OF RIGHT AUDITORY NERVE.

A leash of vessels was found superficial to the nerve; no line of cleavage. Satisfactory division of nerve; seventh nerve seen; a section of the nerve was removed for study. Convalescence was very rapid so that the patient was up and about one week after operation. During the first few days there were slight rotary nystagmus with the quick component to the left, slight double vision on looking to the extreme left, no dizziness, no facial; hissing in the ear was not nearly so marked as before. The portion of the vestibular nerve removed at operation was normal on microscopic examination.

CASE 9

Mrs. S., aged 32 years, was well until five years before, when she began to have buzzing in the left ear; this stopped in a few months. She became pregnant, started again, but stopped after the baby was born. There were no symptoms until one year before examination, when she was again pregnant; she had an attack of dizziness which lasted for two weeks; she felt as though she were drunk. There were several more attacks during pregnancy. After the baby was born buzzing continued and she had been confined to bed a great deal because of dizziness. When she got up, she felt as though she were drunk; had nausea. She described objects as moving to the left. The hearing in the left ear had been decreasing markedly during the year. All routine and laboratory examinations were negative.

Hearing in the right ear was normal. In the left, hearing was decreased but still quite useful; she was able to hear a voice at 20 feet; with the audiometer hearing was reduced forty units on the left.

The caloric test showed definite hypo-activity on both sides. She was kept on the medical side for almost four months, and given large doses of bromides and iodides. There was no improvement. She continued to spend most of her time in bed, had many mild attacks, and was continuously "sea-sick". She preferred to lie on her right side, especially during attacks. There was

marked nystagmus on looking to the right, with the quick component lateral. There was no change in nystagmus with the head at various angles; she tended to fall backwards and to the right. Tinnitus was greatly exaggerated before a severe attack.

Operation.—May 1, 1934. SECTION OF VESTIBULAR PORTION OF LEFT AUDITORY NERVE.

The patient was apparently making satisfactory progress, with a normal temperature and pulse. On the tenth day after operation she suddenly became comatose and died during the night. Autopsy showed an extradural abscess, with compression of the cerebellum.

CASE 10

Mr. R.L., aged 40 years, was admitted to hospital on May 1, 1934. He had always been in good health. Up until one year ago he had had no complaints. At that time he noticed an attack of sudden dizziness, with ringing in his right ear, associated with vomiting. This attack lasted three weeks and then cleared up and he was well until October. At that time he had a recurrence of the dizziness and ringing in his ear, and since then, in October, he had never been free of the noise in the right ear, although it had been greater at one time than another. The patient had another severe attack in November and December. The patient went to see several doctors, had all his teeth removed, but the noise persisted, and when there was low pitch it seemed to start the dizzy attacks, and with that he vomited if he stayed up. If he lay down quietly he might not vomit. Each spell lasted for about four hours. The patient had another severe attack in April, and at that time, while walking home, he noticed that he staggered considerably, although his brain was quite clear, and he kept going to the right side and deviating to the right. When he had an attack he used to lie on his back in bed, and did not move from side to side, as quick turning made him dizzy. The attacks usually came on about the noon hour.

Physical and laboratory examinations were negative. The special ear examination will be detailed later. I had the opportunity of seeing this patient three hours after an attack, when the following notes were made on the nystagmus: The patient was lying flat on his back with head partially flexed. (a) On looking to right there is well marked nystagmus almost horizontal, with quick jerk to right. (b) On looking straight forward, fine quick nystagmus with jerk to right. (c) On looking to left there is no nystagmus. This patient has written out a long detailed account of his illness himself. In part, he writes as follows: "I can tell when an attack is coming on; the buzzing in the ear becomes louder and changes to a lower tone. When trying to walk during an attack I feel just the same as a drunken man with a sick stomach. My weakness or staggering seems to be towards the affected side, in my case the right side, and the objects move anti-clockwise or towards the unaffected side."

Operation.—May 2, 1934. SECTION OF THE VESTIBULAR PORTION OF THE RIGHT AUDITORY NERVE.

In this case there was a good sized vessel cutting across and through the vestibular fibres, about 1 cm. from the internal auditory meatus.

After operation the nystagmus was exactly the opposite to that noted during an attack the day before. In a week it had practically disappeared. The patient returned to work in four weeks and remained perfectly well. He was last seen on December 20, 1934.

CASE 11

Mr. H.V., aged 42 years, was admitted to hospital on May 7, 1934. The patient had noticed buzzing in the left ear since the September previously, which recently had been continuous. In October he had his first attack of dizziness. He wakened at 7.00 a.m. and was dizzy and unable to turn in bed, because of the

feeling of dizziness, which was made worse every time he made a quick turn. He was nauseated but did not vomit with this attack. The patient was most comfortable while lying on his back. He had a second attack two weeks later, which was associated with vomiting and dizziness, and just before the attack the buzzing in his ear increased and became a low whining note, which in subsequent attacks more or less served as a warning to him of the onset. The third attack occurred two or three weeks later and came on after dinner. The patient had had attacks lasting as a rule about four hours, during which time he had to lie still; he was unable to get up out of bed. The later attacks had been quite severe. He did not know of anything which relieved them except rest, and after he stopped vomiting he usually gradually began to feel better. When he was dizzy things did not go round in whirls, but his head felt very unsteady, and he felt weak and things seemed unreal to him. The patient had noticed some deafness in the left ear, which was quite variable. One day he was unable to hear the tick of a watch or spoken voice; the next day he was able to hear fairly well. The noises always have occurred in the left ear. Physical and laboratory examinations were negative.

Operation.—May 8, 1934. SECTION OF THE VESTIBULAR PORTION OF THE LEFT AUDITORY NERVE.

May 9, 1934. There was marked nystagmus on looking to the right.

May 23, 1934. Up and about. He felt 100 per cent better, was cheerful, not draggy and depressed, as before operation. He was last seen on December 20, 1934.

CASE 12

Mr. H.P., aged 50 years, was admitted to hospital on July 3, 1934.

Prior to four years before this patient was carrying on a normal life and felt perfectly well, except for a chronic nasal discharge of some twenty-five years' duration, but during the previous four years he had become almost totally disabled. The continual buzzing in the right ear commenced about four years before and about six months later he noticed that his hearing was not so acute in this ear and his deafness has progressed. Attacks of dizziness had been present throughout the full period, but first occurred about every two months. Latterly, he had had as many as two in one week. They might last anywhere from a few hours to two weeks. During the previous two years the dizzy spells were heralded by a sudden, sharp, ringing noise in the right ear, after which the buzzing increased in intensity and the dizziness followed in a few minutes to one-half day. With the onset of the attacks, he got a sensation of oppression beneath the sternum, and this might sometimes be followed by vomiting, which relieved the oppression but not the dizziness. The vomiting accompanied only the more severe attacks and varied from a single vomiting spell to persistent retching and vomiting of seventeen to eighteen hours' duration, and at which times it was projectile in character. During the longer attacks he became constipated. The patient did not think that the attacks were related to the taking of food or to fatigue or to excitement. However, if he worked for one or two weeks at his usual trade as a carpenter this was always followed by an attack. He had never found any means

of relieving an attack, either by diet, rest or medicine. During the past few years the patient had been treated for sinus disease in the Ear, Nose and Throat Department of the Toronto General Hospital. He had had several operations, but the attacks of dizziness were not relieved. Laboratory and physical examinations were negative.

July 15, 1934. The patient was given 15 grams of NaCl t.i.d. for two days, at the end of which time he had an attack of moderate severity—dizziness, a sense of oppression in his chest, but with absolutely no nystagmus. He did not vomit. The salt was discontinued on July 6th. Ammonium chloride, 3 grams with each meal, was started on July 11th. In the interval between the two treatments the patient had only minor dizziness as during previous week. Since ammonium chloride had been taken the patient's symptoms were definitely worse. This morning he had an attack as severe as any he had ever had. There was no nystagmus, he felt slightly nauseated, but had not vomited yet.

July 17, 1934. The patient had now had 66 grams of ammonium chloride over a period of seven days. On this date he was worse than he had ever been—marked tinnitus, dizziness, and vomiting all day. Nystagmus was present at night for the first time since he was in hospital. It was present on deflection of the eyes towards the left, and also, but to a lesser degree, on upward rotation of eyes; it was definitely not present on deflection to right or downwards. The ammonium chloride was discontinued at night.

Operation.—July 23, 1934. SECTION OF THE VESTIBULAR PORTION OF THE RIGHT AUDITORY NERVE.

Following operation there was nystagmus on looking to the side not operated on; this disappeared in a week and the patient returned to work a few weeks later. On the side operated on the patient was able to hear ordinary speech without difficulty at a distance of six feet. Special ear examination showed that hearing before and after operation was practically the same. Caloric response was abolished by the operation. The patient was seen six months after operation and was well.

REFERENCES

1. DANDY, W. E.: Ménière's disease: its diagnosis and a method of treatment, *Arch. Surg.*, 1928, 16: 1127.
2. COLEMAN, C. C. AND LYERLY, R.: Ménière's disease: diagnosis and treatment, *Arch. Neurol. & Psych.*, 1933, 29: 522.
3. CAIRNS, H. AND BRAIN, R.: Aural vertigo: treatment by division of the eighth nerve, *The Lancet*, 1933, 1: 946.
4. MCKENZIE, K. G.: Intracranial division of the vestibular portion of the auditory nerve for intractable vertigo, with two case reports, *Trans. Acad. Med., Toronto*, November 15, 1932.
5. DANDY, W. E.: Treatment of Ménière's disease by section of only the vestibular portion of the acoustic nerve, *Bull. Johns Hopkins Hosp.*, 1933, 53: 52.
6. STREETER, G. L.: On the development of the membranous labyrinth and the acoustic and facial nerves in the human embryo, *Am. J. Anat.*, 1907, 6: 139.
7. WATT, J. C. AND MCKILLOP, A. N.: The relation of arteries to roots of nerves in the posterior fossa of the cranium in man, *Arch. Surg.*, (in the press), 1934.
8. MCKENZIE, D.: Nystagmus during the Ménière's attack, *J. Laryngol. & Otol.*, 1924, 39: 322.
9. FURSTENBERG, A. C.: Ménière's symptom-complex: medical treatment, *Trans. Am. Otol. Soc.*, 1934, 24: 126.
10. DANDY, W. E.: Treatment of so-called pseudo-Ménière's disease; effects on hearing after sub-total section of the cochlear branch of the auditory nerve, *Bull. Johns Hopkins Hosp.*, 1934, 55: 232.

THE RADIOLOGICAL FINDINGS IN PRE-PYLORIC LESIONS*

BY A. C. SINGLETON, M.D.,

Toronto

THE interpretation of small pyloric and pre-pyloric deformities, as seen on fluoroscopic examination and radiographs of the adult stomach, remains one of the most difficult problems in radiology. While this portion of the stomach may be readily filled with contrast media, is easily visualized, and in most cases can be palpated without difficulty, a number of factors combine to render pre-operative diagnosis difficult in many cases, and impossible in a few. When a fairly large portion of the pars pylorica is involved the diagnostic difficulties are usually less, but when the deformity is limited to the extreme distal portion of stomach the greatest care is required in its interpretation, particularly in view of the frequency of malignant lesions in this segment of the stomach.

While many excellent papers have been written dealing with pathological changes in the pyloric end of the stomach, few have been limited to the consideration of the small pre-pyloric segment in which the greatest difficulty has been encountered. For the purpose of the present discussion the term "pre-pyloric region" will be limited to include only that small distal portion of the stomach immediately proximal to the pyloric sphincter which is not more than two and one-half centimetres in length.

The radiological diagnosis in these cases is arrived at by a careful evaluation of the fluoroscopic and radiographic findings: (a) in the pre-pyloric segment; (b) in the remainder of the stomach.

Intrinsic disease in the pre-pyloric segment may be simulated by a number of conditions, the commoner of which are: (a) anatomical variations of the pre-pyloric segment; (b) gastrosplasm referred from disease elsewhere; (c) involvement in extra-gastric disease by extension or adhesions.

* A paper read at the joint meeting of the sections of Radiology of the American and Canadian Medical Associations, Atlantic City, June 12, 1935.

From the Departments of Radiology, University of Toronto and Toronto General Hospital.

ANATOMICAL VARIATIONS

The commonest anatomical variation in the pre-pyloric region takes the form of one or more transverse folds or rugæ of gastric mucosa, situated usually within one and one-half centimetres of the pyloric sphincter, and causing a single or double indentation on the lesser curvature. The fold may be so small as to be barely discernible, or large enough to extend well into the lumen of the stomach (Cole¹). When a double fold is present the deformity may simulate an ulcer crater. The differential diagnosis, however, is usually not difficult. The absence of associated spasm, the passage of peristalsis through the deformity, and the absence of a six-hour residue, all point to an anatomical variation rather than a pathological change. The findings remain unchanged on re-examination if the whole deformity is due to a pre-pyloric fold or folds (Fig. 1A).

REFERRED GASTROSPASM OF THE PRE-PYLORIC SEGMENT

In the radiological interpretation of pre-pyloric deformities spasm is responsible for a great part of the difficulty encountered. Referred spasm may be due to disease anywhere in the abdomen and occasionally also to disease in the chest. The most frequent causes are, however, pathological changes elsewhere in the gastro-intestinal tract, notably gastric ulcer on the lesser curvature, duodenal ulcer, gall-bladder, and appendiceal disease. Reflex gastrosplasm may be suspected as the cause of pre-pyloric deformity where other co-existing gastro-intestinal disease is found. Its proof, however, lies in demonstrating a normal pre-pyloric segment after such causative lesion has been removed or treated satisfactorily, or on disappearance of the deformity after the administration of antispasmodics (Fig. 1B).

With regard to antispasmodics we have found that a period of ten days to two weeks on a bland diet, preferably accompanied by bed rest,

is far superior to any of the so-called antispasmodics in overcoming gastrosplasm, and while this causes some delay in arriving at a conclusion we feel that the delay is justified in view of the results obtained.

INVOLVEMENT IN EXTRA-GASTRIC DISEASE BY ADHESIONS OR EXTENSION

The proof of the extrinsic disease being the cause of the deformity of the pre-pyloric segment is the demonstration of the causative lesion. This will commonly be found to be cholecystitis with pericholecystic adhesions, duodenal ulcer with periduodenitis, or carcinoma of the gall-bladder, head of pancreas, or ampulla of Vater, with direct extension to the stomach. The pre-pyloric segment of the stomach will seldom be involved alone in these cases, deformity of the duodenum usually being associated, either of the caput or second portion, or both (Fig. 1C).

Of intragastric lesions involving only this portion of the stomach the commoner and more difficult of differentiation are: (a) annular carcinoma; (b) pre-pyloric ulcer; (c) hypertrophic pyloric stenosis.

In the above listing it will be noted that we have one group which is always malignant, one which may be benign or malignant, and one which is obviously benign.

ANNULAR CARCINOMA

Gastric carcinoma is unfortunately seldom seen when the pre-pyloric segment only is involved, but at this early stage it frequently presents peculiar difficulties in its recognition, as it may be closely imitated by pre-pyloric ulcer, hypertrophic pyloric stenosis, and by reflex gastrosplasm. It may be differentiated from the above lesions in most cases by the following characteristics. The deformity persists and is constant on a whole series of films, or on re-examination. Peristalsis is absent in the area involved and the flexibility of the gastric wall is lost. Mucosal markings are absent in the lesion and some degree of pyloric obstruction is usually present, though occasionally infiltration of the sphincter and a gaping pylorus with rapid emptying of the stomach may result. With careful palpation, with the patient at a 30° angle from the erect position, to relax the abdominal muscles and still maintain some of the

downward traction on the stomach produced by the heavy meal, a mass corresponding to the filling defect can usually be palpated (Fig. 2A).

PRE-PYLORIC ULCER

When ulceration occurs in the pre-pyloric segment the ulcer may be benign or malignant. In certain cases carcinomata in this region ulcerate very early and the appearance on radiological examination is that of an ulcer rather than of carcinomatous infiltration. On the other hand, the consensus is that benign ulcers in this region are prone to undergo malignant degeneration. Haudek² and Orator³ agree that about one-third of pyloric ulcers undergo malignant degeneration. Hampton⁴ reports that "the roentgen diagnosis of benign chronic pre-pyloric gastric ulcer . . . was not confirmed by pathological examination in a single case."

Benign ulcers unquestionably occur in this region of the stomach, though much less frequently than on the lesser curvature in the pars media. They present many differences from ulceration of the pars media as well as the difference in potential malignancy. Craters are seen less frequently; spasm is out of all proportion to the size of the ulcer and is much more difficult to overcome than referred gastrosplasm. There is frequently a flattening of the lesser curve just proximal to the sphincter, producing an asymmetrical deformity. Mucosal markings are present, but may be difficult to visualize owing to their being crowded together by muscle spasm. The lesion seldom, if ever, produces a palpable mass. This is probably the most important point in differentiation of the lesion from malignant pre-pyloric ulcer (Fig. 2B).

Malignant ulcer in the pre-pyloric segment may arise from early ulceration of carcinoma or from malignant degeneration of a benign ulcer or benign tumour. Its radiographic characteristics are more clean-cut than in benign ulcer; the crater is usually deeper and larger and is more easily shown. The ulcer crater may be larger than is shown on x-ray films where the ulcer is of the saddle type on the lesser curvature. The crater is usually surrounded by a definite zone of infiltration, and on pressure the "halo sign" of Carman may frequently be demonstrated. Spasm is much less marked if present and is frequently absent, and a mass may usually be palpated correspond-

ing to the defect. Pyloric obstruction to some degree is usually present and a six-hour residue is the rule in these cases.

It is usually impossible to be sure of the innocence of an ulcer in this region by radiological examination alone. It is not infrequently impossible for the surgeon with the abdomen opened, or the resected specimen in his hand, to be certain whether it be benign or malignant. These facts, taken in conjunction with the quoted frequency of malignant degeneration of benign ulcers in this region, we believe warrant the statement that "in any pre-pyloric ulcer within two and one-half centimetres of the sphincter the possibility of its being a malignant ulcer must be seriously considered" (Fig. 2C).

HYPERTROPHIC PYLORIC STENOSIS OF ADULTS

While this condition was described as early as 1885 by Maier,⁵ who found 31 cases in autopsy material, it is only within recent years that it has received the attention it deserves. Its etiology is obscure, the three more commonly accepted theories of causation being: (a) muscle hypertrophy dependent on long continued or recurrent gastrospasm; (b) persistence of a congenital hypertrophic pyloric stenosis of infancy; (c) endocrine or sympathetic nerve imbalance. It would seem from a review of the recent radiological literature that the condition may be divided into two types, namely, that of minor degree, associated with other gastrointestinal disease, and that in which the pyloric stenosis is of greater degree and is the only demonstrable lesion. In the series of cases reported by Kirklin and Harris⁶ 50 of 81 cases were associated with other disease of the gastrointestinal tract, notably duodenal ulcer, gastric ulcer, and chronic cholecystitis with stones. We have observed minor degrees of hypertrophy associated with other lesions, and have assumed that they are caused by spasm and are incidents only in the course of the disease causing them. Of greater significance is the long narrow lesion producing varying degrees of pyloric obstruction not due to other demonstrable disease. The cases reported by Archer,⁷ Elmer and Boylan,⁸ Twining⁹ and others were of this type. The diagnosis of this condition has seldom been made before operation, probably because it has not been sufficiently considered in the differential diagnosis of pre-pyloric lesions and because of

the much greater frequency of annular carcinoma which the lesion may closely simulate.

The defect produced by this lesion may be short, or as much as three centimetres in length. The lumen of the contracted pylorus is central and symmetrical and involves an equal length of greater and lesser curvatures. The impression obtained is that of a narrow tube immediately proximal to and continuous with the sphincter, containing rugæ markings which are usually crowded together. The area of stomach involved may contract fully but never relaxes completely. On careful palpation one may feel a slight sense of resistance over the lesion, but a palpable mass is very unusual. In fact, if one can palpate a mass associated with the defect it is probably an annular carcinoma and not a hypertrophic pyloric stenosis. Kirklin and Harris⁶ have called attention to indentation of the base of the duodenal caput by the hypertrophied pylorus as pathognomonic of this condition. Twining⁹ points out the fact that the pyloric sphincter itself may show hypertrophy but is usually not an integral part of the hypertrophied pyloric muscle, and a slight notch may be seen between the two. The remainder of the stomach usually shows quite markedly hyperactive peristalsis, in spite of which a six-hour residue of considerable amount is nearly always present.

The lesion does not respond to antispasmodics and remains unchanged even after long periods of Sippy diet and bed rest. The age of the patient and duration of symptoms are of little value in the differential diagnosis, as the reported age incidence varies from 14 to over 60 years, with the peak incidence from 30 to 60. The duration of clinical symptoms varies from a few months to many years. The condition is at least two to three times as common in men as in women (Fig. 3A).

Other less common lesions deforming the pre-pyloric segment of the stomach are syphilis, polyposis, and escharotic stricture.

Syphilis of the stomach is seldom if ever seen when limited to the pre-pyloric segment as defined in this discussion. Indeed from the character of the changes produced in the stomach by syphilis it is doubtful if the patient's symptoms would bring him to the physician when only the small pre-pyloric segment is involved. In syphilis of the stomach there is usually seen

a widespread soft infiltration associated with a moderately large or large defect of filling, with absence of gastric rugæ and absence of peristalsis in the involved area and "absence of palpable mass". It is usually on fluoroscopic examination that the first suspicion of syphilis of the stomach is obtained because of the absence of palpable mass associated with a large filling defect and the peculiar pliability of the

involved area of stomach. The Wassermann reaction will further substantiate the diagnosis. Under antiluetic treatment the patient's symptoms usually disappear quite rapidly, but the deformity of the stomach frequently persists, due to fibrosis in the gastric wall (Fig. 3B).

Gastric polypi are seldom limited to the pre-pyloric segment, when present they produce characteristic globular areas of barium displace-

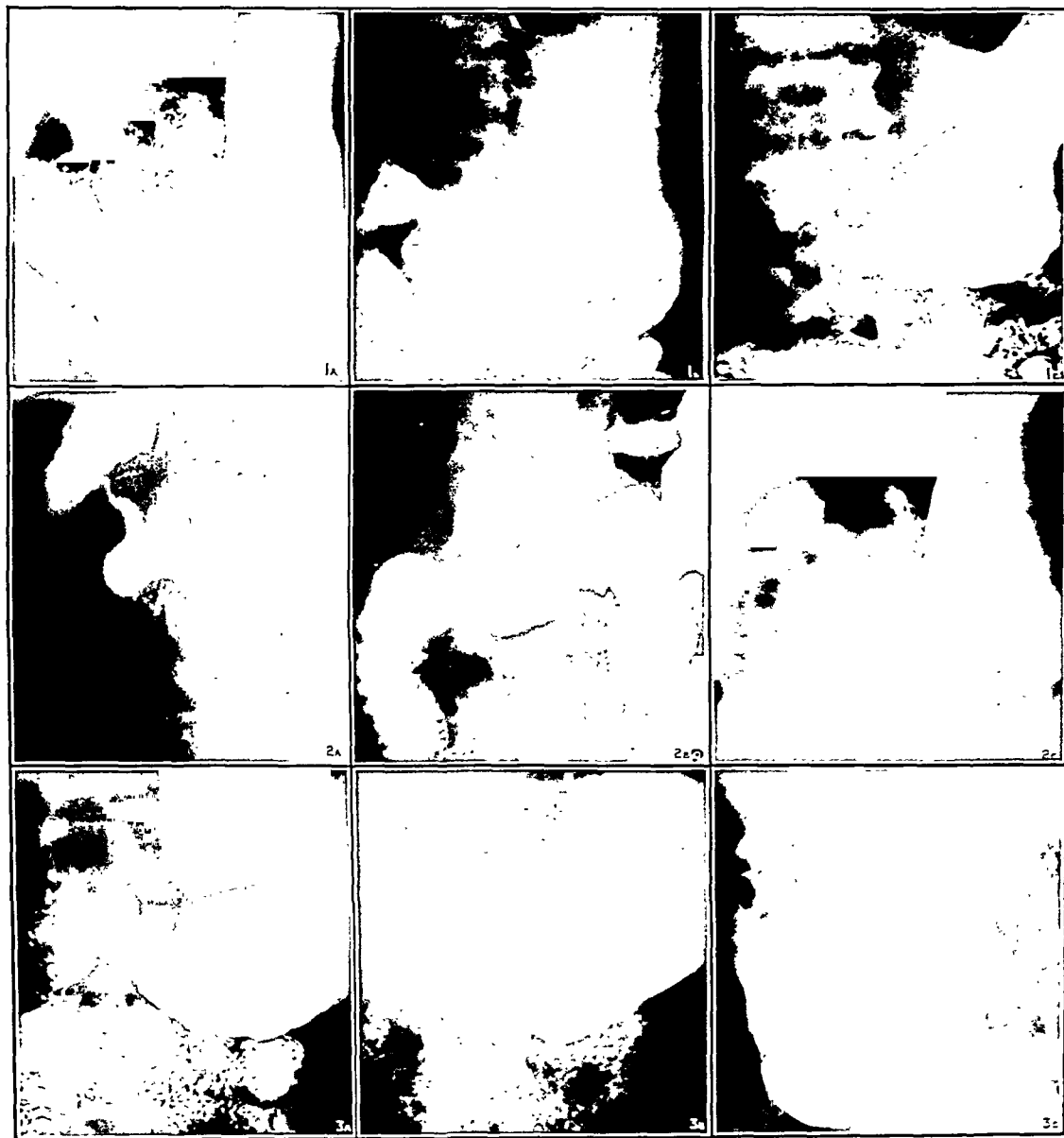


Fig. 1.—Shows three simulants of intrinsic disease of the pre-pyloric segment. (A) Single pre-pyloric fold. Anatomical variation in the pyloric end of the stomach. (B) Reflex gastropasm of the pre-pyloric segment due to benign gastric ulcer on the lesser curve. (C) Deformity of the pre-pyloric segment due to direct extension from carcinoma of the head of the pancreas. Fig. 2.—Illustrates three of the commoner intrinsic lesions in the pre-pyloric segment. (A) Annular carcinoma. (B) Benign pre-pyloric ulcer. The centre of the ulcer crater is on the lesser curve, 1 cm. proximal to the sphincter. (C) Malignant pre-pyloric ulcer or early ulcerating carcinoma. (All three diagnoses were confirmed by microscopic examination.) Fig. 3.—(A) Hypertrophic pyloric stenosis in an adult. (B) Syphilis of the stomach. (C) Gastric polyposis.

ment with no interference with peristalsis, and do not delay gastric emptying. A large solitary polyp may be palpable but multiple small polypi can rarely be felt; the partly filled stomach will frequently show polypi in the pars media and cardiac end associated with those more easily visualized at the pylorus (Fig. 3C).

Benign stricture due to escharotics produces characteristic radiological findings in the stomach. Here again usually more than the pre-pyloric segment is involved. The defect is either a smooth cone with its apex at the sphincter or a sharp clean-cut constriction with almost complete obstruction. No mass will be palpated in these cases. The gastric stricture is usually associated with a long smooth conical stricture of the lower end of the œsophagus and a history of having swallowed an escharotic will be obtained.

DISCUSSION

Of the lesions mentioned above, the ones causing greatest difficulty of differentiation are those producing moderately short tubular contractions of the barium shadow in the pre-pyloric region, suggesting an elongation of the pyloric sphincter. This group comprises annular carcinoma, pre-pyloric ulcer, and hypertrophic pyloric stenosis, any of which may be simulated by gastrospasm of the pre-pyloric segment. Repeat examination after the patient has been ten days to two weeks on bland diet has been found extremely valuable in our hands in ruling out local or referred spasm of the pre-pyloric segment and pyloric sphincter

as the sole cause of the deformity. The Wassermann reaction should not be overlooked in these cases, though one must not forget that a patient can have carcinoma of the stomach and a positive Wassermann at the same time. By ruling out referred spasm, by re-examination after a period of ten days to two weeks on bland diet, by knowing the Wassermann reaction, and by following the criteria of differentiation above discussed, the correct diagnosis of pre-pyloric gastric lesions will be made in the majority of cases. There will remain, however, a number of cases in which the diagnosis before operation cannot be established with certainty, and in which malignancy cannot be excluded. The high incidence of carcinoma in this segment of the stomach must be borne in mind, and in any annular deformity in this region the condition may well be considered malignant, unless strong indications of a benign lesion are found at the original observation or on re-examination after a short interval of dietary treatment.

REFERENCES

1. The Cole Collaborators: Radiologic Exploration of the Mucosa of the Gastro-Intestinal Tract, The Bruce Publishing Co., St. Paul, 1934.
2. HAUDEK, M.: X-rays in diagnosis of early carcinoma of the stomach, *Brit. J. Radiol.*, N.S., 1929, 2: 421.
3. ORATOR, V.: Quoted by Haudek.
4. HAMPTON, A. O.: The incidence of malignancy in chronic pre-pyloric gastric ulceration, *Am. J. Roentgenol.*, 1933, 30: 473.
5. MAIER, R.: Quoted by Archer.
6. KIRKLIN, B. R. AND HARRIS, M. T.: Hypertrophy of the pyloric muscle of adults—a distinctive roentgen sign, *Am. J. Roentgenol.*, 1933, 29: 437.
7. ARCHER, V.: Hypertrophic pyloric stenosis in adults, roentgen aspects, *Am. J. Roentgenol.*, 1930, 23: 510.
8. ELMER, R. F. AND BOYLAN, C. E.: Hypertrophic pyloric stenosis in the adult, *Am. J. Surg.*, N.S., 1924, 24: 499.
9. TWINING, E. W.: Chronic hypertrophic stenosis of the pylorus in adults, *Brit. J. Radiol.*, N.S., 1933, 6: 644.

STATISTICAL STUDY OF 2,921 CASES OF APPENDICITIS.

—In a report of 2,921 cases of appendicitis admitted to the Cincinnati General Hospital M. R. Reid, D. H. Poer and P. Merrell observed that appendicitis is a disease of adolescent and young adult life and that it is twice as common in the male as in the female. The average elapsed time (3.8 days) between the onset of symptoms and admission to the hospital was much too long for proper surgical treatment, and the mortality rate will remain high as long as patients are not operated on earlier. Complications will also be frequent and the hospitalization period long. Approximately 60 per cent of the acute cases were admitted during the first attack, and approximately 40 per cent of all cases were admitted after the appendix had ruptured. These facts reveal the danger of expectant treatment. The use of purgatives was found to lessen very definitely the patient's chances of recovery. The incidence of perforation and death was

much higher among those who had taken cathartics. In more than 40 per cent of the cases of acute appendicitis, perforation had occurred before admission to the hospital and the percentage of perforations has decreased very little during the last few years. More than 98 per cent of the deaths from appendicitis were due to the complications accompanying perforation. The mortality rate in acute unruptured appendicitis (0.86 per cent) was low in comparison with the mortality rate after rupture (with abscess formation, 11.4 per cent; with peritonitis, 33.9 per cent). The death rates for cases presenting abscess and general peritonitis are very high in comparison with the rates reported by many surgeons who have adopted the more conservative methods of treatment. Since this study was made the authors have been using the conservative or Ochsner treatment for the cases in which they have thought it was indicated, and plan to make a comparison of the death rates at a later date.—*J. Am. M. Ass.*, 1936, 106: 665.

ARTIFICIAL PNEUMOTHORAX IN LOBAR PNEUMONIA: A REPORT OF TEN CASES*

BY JOHN G. HOWLETT, M.D., RAYMOND LUFT, B.Sc., M.D. AND E. B. ASTWOOD, B.Sc., M.D.,

Montreal

[T is surprising, when one considers how long and how enthusiastically artificial pneumothorax has been used in the treatment of pulmonary tuberculosis, that it was not used earlier in the treatment of lobar pneumonia.

It was in 1915, when Moritz¹⁶ introduced nitrogen into the pleural cavity for dry pleurisy, that pneumothorax was first attempted in acute lung conditions. Not until 1921, however, were his good results confirmed by Henius.⁸ Friedemann,⁷ in 1921, was the first to publish an account of pneumothorax in lobar pneumonia. He postulated that rest to the lung would cause a relief of pain, a diminished lymphatic absorption of toxins and bacteria, and have a salutary effect on the lung itself. His 9 cases showed such hopeful results that during the same year there appeared the reports of David⁵ and Burckhardt,³ who agreed heartily with the rationale of this procedure. Schottky¹⁹ in 1923 obtained an excellent result in his case. Ibrahim and Duken¹⁰ in 1928, by repeating their success in the treatment of 3 children, introduced pneumothorax to paediatrics, where it met with great favour. Klotz¹² in 1929 reported 4 cases in children; in 1930 Jahr and Neuman¹¹ used it in 5 infants with good results, and in the same year Duken⁶ reported 4 additional cases. There are only a few scattered references to its use during the next 8 years. The English literature remained strangely silent on the subject until Coghlan⁴ recorded his 6 cases in 1932, whereupon Anderson¹ used it in 4 cases with uniform benefit and Li¹⁴ in 6 cases with 5 successes. It is only during the last three years that any great enthusiasm has been displayed on this continent.

The usual experience with the procedure is that it relieves or abolishes pain, dyspnoea, cough and cyanosis, and in many instances causes a crisis or an early lysis in the disease. To the argument of favourable experience most authors add that the inflamed lung is put at rest and that the separation of the inflamed pleuræ may prevent the occurrence of empyema. Others suggest that the flow of blood and lymph through the collapsed lung is slowed and lessened, thereby preventing the absorption of the toxins of the disease. One states that after the induction of pneumothorax the sputum becomes negligible in amount. Another thinks that collapse prevents the spread of pneumonia to the

contiguous lung. The arguments against artificial pneumothorax in this connection are as yet not coherent or numerous, and up to the present time the precautions in its use are not well established. No sufficient explanation has as yet been offered for the many changes which occur following the induction of artificial pneumothorax in lobar pneumonia. Its mechanics is little understood.

The series here presented is a small one—10 in all. The requirements were that the disease be unilateral and the patient an adult. In most of the cases three x-ray pictures were taken, one before the initial treatment, the second after the last refill, and the last just before the patient's discharge from the hospital.

The technique employed was simple. A sedative, commonly morphia, if indicated by much coughing, was given beforehand. This lessened coughing, it made accurate readings of intrapleural pressures possible, and it helped to prevent interstitial emphysema. The skin was sterilized with iodine and alcohol and the chest wall was easily and thoroughly anaesthetized with $\frac{1}{2}$ or 1 per cent novocaine. Pressure readings were taken on a water manometer and expressed in centimetres of water. Measured volumes of air were introduced and readings taken after each 50 or 100 c.c. had been allowed to enter, in order that the mean final pressures would not exceed atmospheric. It was considered that if these precautions were observed no harm could be caused by the procedure.

CASE 1

L.M., a female, married, aged 37 was admitted February 22, 1934. Lobar pneumonia of the right upper lobe in the third day of disease was diagnosed. Temperature 102.6°; pulse 115; respirations 30. The leucocyte count was 11,000. Pneumococcus Type I was found in the sputum and on blood culture. Artificial pneumothorax was induced through the second right interspace in the midclavicular line as follows:

* From the Medical Department, Royal Victoria Hospital, Montreal.

Feb. 23rd, 5 p.m.,	I.P. - 10	- 1	
	F.P. - 8	0	150 c.c. of air
Feb. 24th, 4 p.m.,	I.P. - 6	0	
	F.P. - 2	+ 4	100 c.c. of air

It was decided that the pneumothorax was a pocketed one and further fills were not given. No chart of this case is presented as no change was indicated that could be attributed to the artificial pneumothorax. The patient continued to be extremely ill. The pneumonia spread throughout the entire right lung and finally a loculated empyema formed. The patient was transferred to the Surgical Service on March 10th for thoracotomy. She recovered.

CASE 2

I.S., a female, aged 16, was admitted February 9th (Chart 1). The diagnosis was lobar pneumonia of the right lower lobe, in the second day of disease. There was no sputum. The patient complained of slight pain in the right side of the back. She was dyspnoic and suffered from frequent dry cough. The leucocyte count was 9,200. The patient appeared not more than moderately ill. Artificial pneumothorax was induced through the 6th right intercostal space in the posterior axillary line as follows:

Feb. 9th, 4 p.m.,	I.P. - 17	- 9	
	F.P. - 6	- 3	500 c.c. of air
Feb. 10th, 1 p.m.,	I.P. - 8	- 4	
	F.P. - 5	- 3	500 c.c. of air
Feb. 11th, 6 p.m.,	I.P. - 10	- 2	
	F.P. - 7	+ 1	300 c.c. of air
Feb. 12th, 3.30 p.m.,	I.P. - 10	- 3	
	F.P. - 2	+ 2	600 c.c. of air

A uniform collapse to about one-third of the size of the normal right lung was produced. There was almost complete relief of pain and dyspnoea and the general condition was much improved. Convalescence in hospital was prolonged because of our lack of familiarity with this method of treatment. She was discharged after 32 days in hospital with 20 per cent collapse of the lung and convalescence far advanced.

CASE 3

M.R., a male, aged 41, was admitted on February 16, 1935. A diagnosis of lobar pneumonia of the right lower lobe, in the fourth day of disease, was made. Pneumococcus Type III was found in the sputum. He complained of severe pain, worse on inspiration, in the right lower axilla. He coughed and hiccupped almost continuously. There was slight cyanosis of the fingertips. The leucocyte count was 17,000. Artificial pneumothorax was induced through the second interspace on the right side in the midclavicular line as follows:

Feb. 16th, 6.30 p.m.,	I.P. - 10	?	
	F.P. - 6	+ 1	300 c.c. of air
Feb. 17th, 11.30 a.m.,	I.P. - 6	- 1	
	F.P. - 4	+ 1	400 c.c. of air

The hiccupping and coughing continued. There was great interstitial emphysema of the chest wall. The signs of pneumothorax persisted for but a short time after each filling. The patient cooperated poorly. The attempt to apply this treatment was abandoned. Following each treatment there was marked temperature fall without significant change in the patient's condition. Crisis occurred on the seventh day and a normal convalescence followed.

CASE 4

J.M., a female, married, aged 31, was admitted March 28, 1935. Diagnosis was made of lobar pneumonia of the left lower lobe in the third day of disease. Group IV pneumococci were found in the scanty yellow

sputum. The leucocyte count was 22,800. The patient complained of moderately severe pain in the left axilla, worse on inspiration and on coughing. The cough was frequent and troublesome, and there were moderate dyspnoea and an expiratory grunt. Artificial pneumothorax was induced through the second left intercostal space in the midclavicular line as follows:

March 28th, 10.30 p.m.,	I.P. - 10	- 4	
	F.P. - 5	+ 4	650 c.c. of air
March 29th, 10.00 a.m.,	I.P. - 8	+ 5	
	F.P. - 4	+ 7	350 c.c. of air
March 29th, 10.00 p.m.,	I.P. - 3	+ 5	Reading only
April 1st, 3.30 p.m.,	I.P. - 4	+ 5	Pressure readings only

The pain and dyspnoea were completely relieved and there was no longer an expiratory grunt. She was discharged feeling quite well after sixteen days in the hospital, and at that time her lung was about half its usual volume. On return for physical examination, ten days later, there was no evidence of pneumothorax.

CASE 5

C.H., a male, aged 42, was admitted on April 15, 1935. A diagnosis of lobar pneumonia of the right lower lobe was made. Type I pneumococcus was found in the abundant rusty sputum. He was moderately dyspnoic, there was no cyanosis, and he complained of a moderately severe pain, worse on inspiration, in the right axilla. The leucocyte count was 19,000. The patient, who was far from robust, appeared to be, if not dangerously, at least seriously, ill. Artificial pneumothorax was induced through the second right interspace in the midclavicular line as follows:

April 15th, 9 p.m.,	I.P. - 7	- 3	
	F.P. - 5	+ 1	600 c.c. of air
April 16th, 2.30 p.m.,	I.P. - 6	0	
	F.P. - 4	+ 3	400 c.c. of air
April 17th, 11 a.m.,	I.P. - 7	0	
	F.P. - 5	+ 3	200 c.c. of air
April 18th, 3.15 p.m.,	I.P. - 7	- 2	
	F.P. - 6	+ 3	300 c.c. of air

A uniform collapse of the diseased lung to about one-third of the normal volume was secured. Moderate general improvement followed. The pain and dyspnoea were permanently and completely dissipated, but the bloody sputum, averaging about 75 c.c. daily, continued until the twentieth day of the disease. It then became bloodless and expectoration ceased a few days later. No tubercle bacilli were found on repeated examinations. Aspiration of 300 c.c. of turbid sterile fluid was performed on May 11th. The effusion did not reaccumulate. There was no sufficient explanation for the long continued slight elevation of temperature which became normal on the twentieth day. Convalescence in hospital was prolonged, because of the elevation of the temperature and the abundance of the sputum, to 32 days. He returned for examination ten days later. The examination was then negative and convalescence was satisfactory.

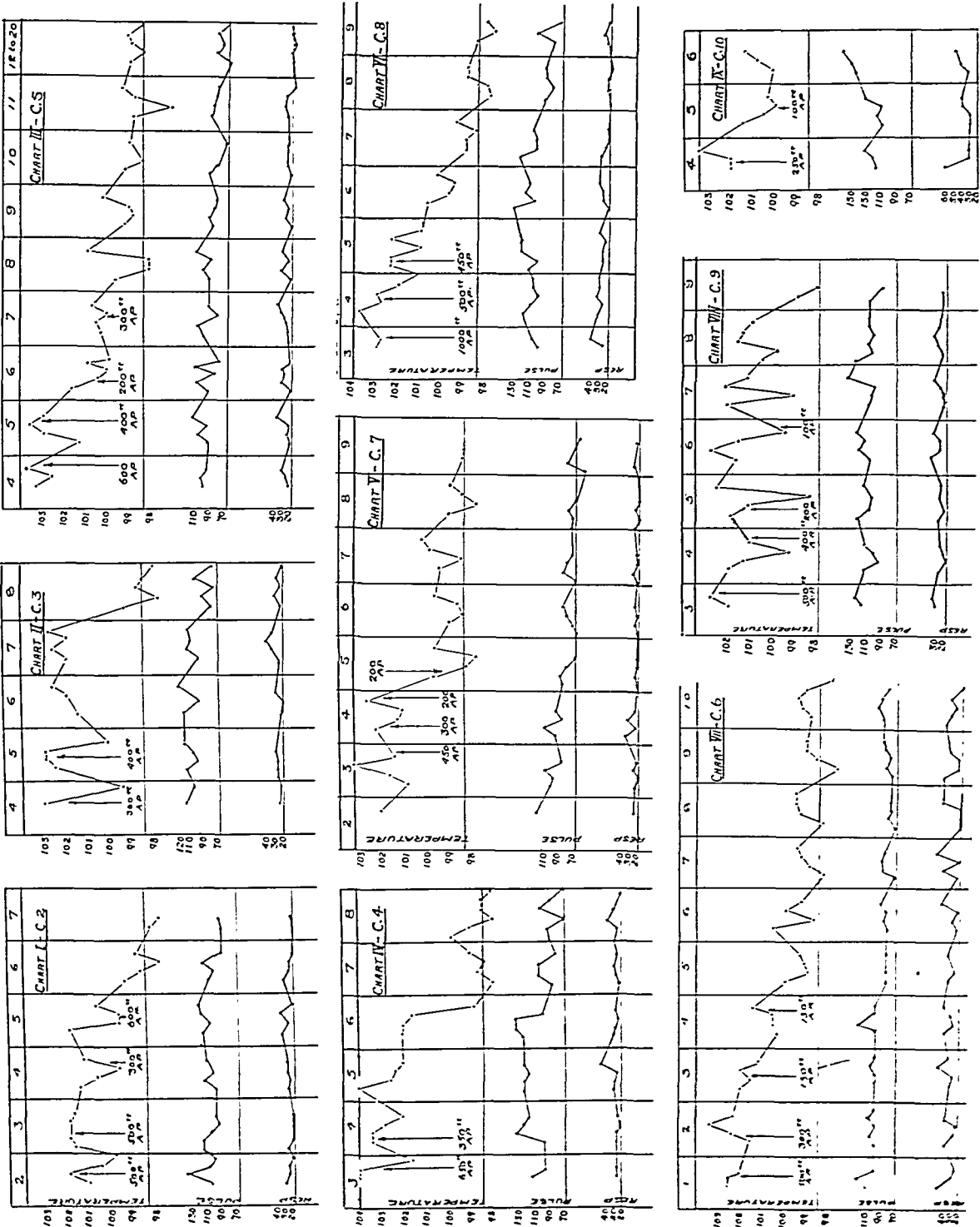
CASE 6

J.R., a male, aged 24, was admitted on April 16, 1935. The patient had suffered with periodic bouts of cough, fever and the expectoration of yellow sputum for two weeks. Sixteen hours before admission he developed abruptly fever, a cough, a severe pain, worse on inspiration, in the right lower axilla, and began expectorating bloody sputum. On examination he was moderately dyspnoic and there was no cyanosis. He was considered to be in the first day of disease. Group IV pneumococcus was found in the sputum. The right lower lobe was consolidated. The leucocyte count was 5,000. The patient appeared to be dangerously ill. Artificial pneu-

mothorax was induced in the second right interspace in the midclavicular line as follows:

April 16th, 7 p.m.,	I.P. - 8	- 3	
	F.P. - 5	+ 3	500 c.c. of air
April 17th, 9.30 a.m.,	I.P. - 7	- 2	
	F.P. - 5	+ 3	300 c.c. of air
April 18th, 1.30 p.m.,	I.P. - 7	0	
	F.P. - 6	+ 2	150 c.c. of air
April 19th, 5 p.m.,	I.P. - 7	+ 1	
	F.P. - 6	+ 3	150 c.c. of air

There was some anterior posterior collapse of the diseased lobe but it continued adherent to the chest wall in the axilla. There was collapse of the healthy lung. The dyspnoea was slightly relieved and the pain, moderately. Two days following the induction of the artificial pneumothorax his condition had so improved that the prognosis, instead of being bad, was excellent. The sputum, at times almost pure blood, increased in amount to an average of about 150 c.c. daily and continued so for more than two weeks after the temperature, pulse and respirations were normal and he felt quite



well. Tubercle bacilli were not found. Activity during his hospital convalescence was much curtailed because of the bloody sputum. It was nevertheless rapid. He was discharged thirty-two days after admission. On return ten days later for physical examination, which was negative, he was found to be making a remarkably rapid convalescence.

CASE 7

M.A., a male, aged 51, was admitted on April 23rd, with lobar pneumonia of the left upper and lower lobes. Type IV pneumococcus was found in the sputum. He was in the second day of the disease. Cough was frequent and the sputum was rusty. He complained of severe pain, worse on inspiration, in the left lower axilla and along the left costal border. There were moderate dyspnoea, an expiratory grunt and shallow breathing. Cyanosis was present but slight. The leucocyte count was 13,000. His disease was considered to be of moderate severity. Artificial pneumothorax was induced through the second left interspace in the mid-clavicular line as follows:

April 24th, 10 p.m.,	I.P. - 10	0
	F.P. - 5	+ 5 450 c.c. of air
April 25th, 10 a.m.,	I.P. - 9	+ 2
	F.P. - 6	+ 6 300 c.c. of air
April 25th, 10 p.m.,	I.P. - 8	+ 4
	F.P. - 5	+ 5 200 c.c. of air
April 26th, 10 a.m.,	I.P. - 6	+ 4
	F.P. - 4	+ 5 200 c.c. of air

The x-ray showed the left lung uniformly collapsed to about one-half its normal size, but not separated from the diaphragm. Cough and pain were greatly relieved. There was still on occasion slight pain in the left axilla, but dyspnoea was completely relieved and there was no longer cyanosis nor an expiratory grunt. The sputum continued rusty until the temperature became normal, its daily volume at first averaging about two ounces; it gradually diminished and there was none on discharge. He was discharged after eighteen days in hospital. There was, by x-ray a small pneumothorax still present over the apex. He returned in ten days for examination. The examination was negative. The convalescence was progressing favourably.

CASE 8

G.R., a male, aged 26, was admitted on April 27, 1935. A diagnosis was made of lobar pneumonia of the right upper lobe in the third day of disease. Pneumococcus Type I was found in the sputum. There was a history of having been ill with bloody urine in 1928. His urine was bloody on admission and his breath had a urinous odour. The leucocyte count was 26,000. The blood non-protein nitrogen was 118 mg. per cent and the creatinine 3.74 mg. per cent. The respirations were shallow with an expiratory grunt, there was slight cyanosis, and he complained of an aching pain in the right axilla and along the right costal margin, worse on inspiration and coughing. He coughed frequently but there was no sputum on admission. He was thought to be dangerously ill. Artificial pneumothorax was induced in the 8th interspace, in the posterior axillary line as follows:

April 27th, 8.50 p.m.,	I.P. - 9	- 5
	F.P. - 4	+ 1 1000 c.c. of air
April 28th, 2.30 p.m.,	I.P. - 9	- 2
	F.P. - 6	+ 3 500 c.c. of air
April 29th, 10 a.m.,	I.P. - 10	0
	F.P. - 8	+ 5 450 c.c. of air

There were physical signs of pneumothorax throughout the whole of the right chest. X-ray showed adhesion of the lateral aspect of the pneumonic area to the chest wall. It was considered that the whole lobe was not adherent, but rather that the x-ray shadow was due to a broad adhesion and that the diseased area was well collapsed antero-posteriorly. The nurses' notes state that following the initial pneumothorax: "Pain was relieved and respirations improved immediately." On the day following the induction he read the morning paper. The expectoration of bloody sputum, about an ounce daily, began on the day following the pneumothorax induction and continued for four days, but there was no cough except that associated with expectoration. Because of the hæmorrhagic nephritis the patient was detained in hospital for thirty-nine days. He felt perfectly well. The sedimented urine on discharge contained rare red blood cells and granular casts; the blood non-protein nitrogen was 29.4 mg. per cent, and the creatinine was 1.16 mg. per cent.

CASE 9

E.V., a female, married, aged 46, was admitted on May 8th. A diagnosis was made of lobar pneumonia, right lower lobe, and of acute left otitis media. The leucocyte count was 17,000. Type III pneumococcus was found in the sputum. She complained of pain and deafness of the left ear; pain, worse on inspiration, in the right lower axilla; pain on movement of the right shoulder; and of tightness in the chest behind the sternum. There was no dyspnoea, cyanosis, or sputum on admission, but cough was troublesome. Her illness appeared to be one of moderate severity. Artificial pneumothorax was induced through the second right interspace in the midclavicular line as follows:

May 8th, 9.15 p.m.,	I.P. - 8	- 1
	F.P. - 4	+ 2 500 c.c. of air
May 9th, 11 p.m.,	I.P. - 6	+ 1
	F.P. - 5	+ 3 400 c.c. of air
May 10th, 11 a.m.,	I.P. - 4	+ 1
	F.P. - 4	+ 3 200 c.c. of air
May 11th, 10 p.m.,	I.P. - 4	+ 2
	F.P. - 4	+ 3 100 c.c. of air

The x-ray after the last refill showed the lung to be uniformly collapsed to about one-half its normal volume. The patient's general condition appeared to be considerably improved. The acute pain in the right axilla was much ameliorated. There was no longer tightness of the chest. Cough continued to be troublesome and the expectoration of bloody sputum began on the day after admission and averaged an ounce daily. The sputum gradually improved in colour and diminished in amount, until it disappeared on May 22nd. The patient became quite jaundiced, the ear discharged, and a mastoiditis developed. She was transferred to the Department of Oto-Laryngology and operated on, on May 27th. Pneumococcus Type III was found in the abundant green pus from the mastoid cells. Twenty c.c. of sterile turbid fluid were aspirated from the right pleural cavity on May 26th. There was no reaccumulation. There was no evidence of pneumothorax on June 1st and convalescence is now progressing satisfactorily.

CASE 10

J.R., a male, aged 44, was admitted on May 9, 1935. A diagnosis was made of lobar pneumonia of the right upper and lower lobes. He was in the fourth day of the disease. Group IV pneumococcus was found in the bloody sputum. He was dyspnoeic, very cyanotic, and complained of severe pain in the right axilla and back. The leucocyte count was 13,000. His condition was desperate. Artificial pneumothorax was induced through the fourth right interspace in the midclavicular line as follows:

May 9th, 3	p.m., I.P. - 7	- 2	
	F.P. - 3	+ 3	250 c.c. of air
May 10th, 1.30	p.m., I.P. - 8	+ 1	
	F.P. - 5	+ 5	100 c.c. of air

The pain and dyspnoea were greatly relieved. There was evidence of thin pneumothorax over the right chest, in the anterior superior aspect. His general condition was not in the least improved and he died. There was no autopsy.

TECHNIQUE

An additional precaution suggested itself following the occurrence of a loculated empyema in the first case. In this case the needle was inserted through the second right interspace immediately over the diseased right upper lobe, and later one of the loculations of the empyema was found to extend from the second interspace towards the apex. It is well known that needle puncture of pneumonic lungs has frequently been done without being followed by empyema, but when the pneumothorax is being induced the needle can be inserted through an interspace away from the diseased lung and so save the procedure from suspicion should an empyema develop. It is also known that intrapleural pressures vary appreciably, depending on the position of the patient, and this may be an important consideration from the investigator's point of view.

Knowledge of the amount of air to be given and the frequency of the refills is best acquired from experience, but some rough criteria may be advanced. When air is being allowed to run in and a considerable volume does not cause a rise of the mean pressure to the atmospheric level, one must be guided as to the amount by the relative size of the patient and the shift of the mediastinum as measured by the outward movement of the cardiac apex. It is probably ill-advised to cause any considerable shift of the mediastinum, for fear of causing circulatory embarrassment. Increasing respiratory embarrassment would of course be a contraindication to any further injection of air, but we have not met with this symptom in any of our cases. The largest volume given in this series at one time was 1,000 c.c., which produced no detectable outward shift of the cardiac apex. A second filling is advisable about twelve hours after the first. If on physical examination the pneumothorax has become smaller, and the pressures have become more negative, it is presumed that

the air is being rapidly absorbed. Subsequent treatments are to be given at intervals of twelve hours, or until such time as the pressures are evenly maintained; the intervals are then lengthened or the treatments stopped.

The use of morphia or other similar drug may have some objection from the investigator's point of view. Morphia corrects reflex dyspnoea to some extent. As observations on dyspnoea, intrapleural pressures, and other associated phenomena were being made it was usually omitted in this series. Its use, however, is advisable in the routine of ordinary treatment.

CLINICAL OBSERVATIONS

The amelioration of pain was quite definite. After the pneumothorax had been induced it was occasionally noted that whilst the severe pain, aggravated by inspiration and coughing, had disappeared there remained a dull, not severe, ache, sometimes made a little worse by the deepest inspirations.

The relief of dyspnoea after the induction of the pneumothorax was also a notable feature. Frequently breathing was still moderately rapid, but it was deeper; there was no longer a respiratory grunt, and the patient was freed of the distress commonly so marked because of these symptoms.

Cough was lessened in most, though not in all, cases. In one case it was so persistent that it was responsible for a great tissue emphysema, and the effort to maintain the pneumothorax had to be abandoned. Except in the fatal case, cyanosis was not a very marked sign in this series. The clinical observation was that when present it was lessened, and that no cyanosis developed after artificial pneumothorax had been instituted. It is quite impossible to be sure clinically of minor changes in arterial blood oxygen saturation, and arterial punctures for estimations of this nature were not made.

There was no evidence that the induction of the pneumothorax coincided with the diminution in the amount of expectoration. Indeed, the expectoration of large amounts of sometimes very bloody sputum started after treatment had begun, and continued beyond the time usually noted in lobar pneumonias not so treated.

No profuse diaphoresis followed the treatments, nor did any unusually early crisis occur.

Lysis occurred in 5 patients. In 3 cases the fever fell by crisis on days of disease common to pneumonia patients. In 3 of the patients, whilst the lysis was quite definitely begun early in the disease, it was markedly prolonged and in 1 case the temperature did not become normal until the twentieth day. It was anticipated that the intrapleural pressures would be markedly negative when the needle was first inserted in the pleural space. One case, I.S., had an initial pressure of -17 cm. of water on inspiration and -9 on expiration. The others, contrary to expectation, appeared well within normal limits.

The final and most important observation was that, with the exception of the one who died, there was improvement subjectively and objectively in the general condition of the patients. So marked was this improvement in some that it was a matter of no inconsiderable surprise to the observers. The only serious complication was the occurrence of empyema in the first case. Small sterile effusions occurred in two cases, but these perhaps ought not really be termed complications.

THEORETICAL DISCUSSION

The explanation of the relief of pain appears to be the one usually advanced, that is, the separation of the inflamed pleural surfaces. Why there should continue to be a dull ache in the side of the chest when once the surfaces have been separated is difficult to answer. It may be that the parietal pleura, having already been inflamed and made œdematous because of its closeness to the visceral pleura of the diseased lung, is responsible for this pain, particularly when it is stretched by the movements of the chest wall.

The problem of providing an explanation for the dissipation of the dyspnoea is a much more difficult and important one. The consensus would ascribe the dyspnoea of lobar pneumonia to pleural pain and to an increased sensitivity of the Hering-Breuer reflex. Anoxæmia is probably of minor importance. The relief of pleural pain has already been discussed. The underlying factor leading to increased sensitivity of the Hering-Breuer reflex has not been established, so it would serve no useful purpose to discuss the relief of dyspnoea from this cause.

Change of cyanosis was not a remarkable feature in this series, and it would be ill-advised to volunteer an explanation of a phenomenon, concerning which we have as yet no accurate measurement.

If cough is diminished, and it seems to be, the diminution may also be due to the correction of some mechanical change or strain which is imposed by the disease on the bronchi.

One may with ease believe that some advantage may accrue from putting the diseased lung at rest, and collapse of the lung almost certainly rests the lung from a ventilatory point of view. These factors may be responsible for lessening the absorption of noxious products from the diseased focus, but our knowledge of the significance of any such toxic absorption is so sketchy that discussion of this point is futile.

In concluding these purely theoretical considerations, it is easier to believe that the general improvement noted in the patients is due to the relief of distressing symptoms and the better oxygenation of blood rather than to any cryptogenic immunological changes that the pneumothorax may have brought about.

SUMMARY AND CONCLUSION

1. Ten selected cases of unilateral lobar pneumonia have been treated by artificial pneumothorax, and suggestive rather than conclusive therapeutic results have been obtained.
2. Relief of pain, dyspnoea and cyanosis was usually observed.
3. The mechanism of the relief of these symptoms is discussed.

We are greatly indebted to Professor J. C. Meakins for permission to use the material in this series.

REFERENCES

1. ANDERSON, H. G.: Note on use of artificial pneumothorax in lobar pneumonia, *Chinese M. J.*, 1932, 46: 769.
2. BEHREND, A. AND COWPER, B. G.: Artificial pneumothorax in treatment of lobar pneumonia, *J. Am. M. Ass.*, 1934, 102: 1907.
3. BURKHARDT, H.: Über die Behandlung der Pneumonie mit künstlichen Pneumothorax, *Deutsche med. Wchnschr.*, 1921, 47: 625.
4. COGHLAN, J. J.: Treatment of acute lobar pneumonia by artificial pneumothorax, *The Lancet*, 1932, 1: 13.
5. DAVID, O.: Zur Pneumothoraxbehandlung der Lungenentzündung, *Deutsche med. Wchnschr.*, 1921, 47: 802.
6. DUKEN, J.: Der künstliche Pneumothorax in der Behandlung der kindlichen Pneumonie, *Klin. Wchnschr.*, 1930, 9: 2195.
7. FRIEDMANN, U.: Über Behandlung der akuten Lungenentzündung mit künstlichen Pneumothorax, *Deutsche med. Wchnschr.*, 1921, 47: 442.
8. HENIUS, K.: Das Pneumothoraxverfahren bei der Behandlung der Pleuropneumonie und Pleuritis Sicca, *Deutsche med. Wchnschr.*, 1921, 47: 7.

9. HINES, L. E. AND BENNETT, D.: Artificial pneumothorax in the treatment of acute lobar pneumonia, *Arch. Int. Med.*, 1935, 55: 100.
10. IBRAHIM, J. AND DUKEN, J.: Zur Behandlung der kindlichen Pneumonie mit dem künstlichen Pneumothorax, *Arch. f. Kinder.*, 1928, 84: 241.
11. JAHR, J. AND NEUMAN, R.: Zur Pneumothorax-Behandlung der Säuglingspneumonie, *Klin. Wchnschr.*, 1930, 9: 2200.
12. KLOTZ, M.: Die Anwendung des Pneumothorax bei Pneumonien im Kindesalter, *Monatschr. f. Kinder.*, 1929, 42: 312.
13. LIEBERMAN, L. M. AND LEOPOLD, S. S.: Therapeutic pneumothorax in experimental lobar pneumonia in dogs, *Am. J. M. Sc.*, 1934, 187: 315.
14. LI, K. H.: Artificial pneumothorax treatment for lobar pneumonia: a report of six cases, *Chinese M. J.*, 1932, 46: 886.
15. MOORMAN, L. J.: Artificial pneumothorax in treatment of pneumonia—report of cases, *Internat. Clin.*, 1934, 4: 118.
16. MORITZ: Ueber Lungenerkrankungen im Kriege, *Ztschr. f. ärztl. Fortbild.*, 1915, 12: 326.
17. MYERS, J. A.: Artificial pneumothorax, *J. Am. M. Ass.*, 1934, 103: 1299.
18. PERLROTH, S. AND TOPERCER, M.: Behandlung der Pneumonien mit künstlichen Pneumothorax, *Wien. klin. Wchnschr.*, 1932, 45: 1508.
19. SCHOTTKY, P.: Zur Pneumothorax-Behandlung der Pneumonie, *Med. Klinik.*, 1923, 19: 1298.
20. VAN ALLEN, C. M. AND WU, C.: Increased elastic tension of lung in experimental pneumonia, *J. Clin. Invest.*, 1932, 11: 589.

HODGKIN'S DISEASE OF BONE*

BY M. C. MORRISON, M.D.,

*Department of Radiology, University of Western Ontario,
London, Ont.*

DURING the past few years it has become apparent that the field of diagnostic roentgenology in the demonstration of pathological processes in the living has been extended to include the changes in bone which have for some time been observed at necropsy in Hodgkin's disease. Further, it would appear not unlikely that certain features regarding the nature of the involvement and the radiographic appearance of these bone lesions may be of special importance in relation to the nature of this malady which has been recognized but not understood for the past 103 years.

The intracerebral inoculation experiments on rabbits by Gordon⁵ and a recent pathological analysis of 33 fatal cases of this disease by Krumbhaar⁶ favour an infectious origin, with suggestions of a virus, but against this theory are the absence of a demonstrable organism, the apparent failure to produce immunity, the lack of transmissibility to lower animals, and the steady malignant progression to a fatal termination, the total absence of cures being unduplicated in any known infection.

Advocates of the inflammatory nature of the disease have coined the term "Hodgkin's sarcoma" for those cases showing definite transition stages to undeniable neoplastic states, and in support of this theory we have the unusual case reported by Welch¹¹ in which an enlarged cervical gland removed six months *ante mortem* showed a lymphogranulomatous structure, while

tumours removed at necropsy from the neck, liver and lung showed replacement of lymphocytes by large round sarcoma-like cells. Warthin,¹⁰ however, believed that Hodgkin's disease and so-called Hodgkin's sarcoma both originated in the perivascular reticulo-endothelium, and that the latter represented a greater differentiation of the cell, no type in his opinion being explainable on the basis of an inflammatory reaction. Ewing⁴ held that mediastinal Hodgkin's disease furnished a large proportion of cases terminating in sarcoma, although the change in the morphological character was often insidious.

Histologically, the term "Hodgkin's group" has come into use as a convenient term to represent that undifferentiated group of atypical cases which seem to be a series of gradations between typical lymphadenoma, leukæmia and lymphosarcoma, but most cases seem to fall into one of the following types: the usual productive inflammatory type showing reticulo-endothelial cells and fibrosis; the hyperplastic type with fewer giant cells and less fibrosis; and the tumour type, the latter differing from the others in its infiltrative and destructive behaviour toward the surrounding tissues, its systemic spread, and the longer course of the disease.

Mention should be made of the plausible hypothesis of Medlar⁹ that the primary Hodgkin lesion is a derangement of hæmatopoiesis in the bone marrow, which conforms to all the requirements of our accepted designation of malignancy, and that all outside lesions should be considered as hæmatogenous tumour growths.

* Read at the combined meeting of the American and Canadian Medical Associations at Atlantic City, Section of Radiology, June 14, 1935.

The apparent selectivity of lymphatic involvement is unexplained and admittedly is observed in both infections and carcinoma, but, indeed, the idea that the real cause of malignant tumours may be an infectious agent should still be borne in mind, as this possibility has not been disproven. In all this controversy it is noteworthy that the pathologist has considered the problem chiefly on the basis of the genesis of lymph-node tumours, whereas information as to the distribution and sequence of involvement would also appear to be a pertinent factor.

BONE INVOLVEMENT

Various clinical and post-mortem studies of Hodgkin's disease during the past ten years indicate that the osseous system is involved in from 10 to 50 per cent of cases irrespective of the age of the patient. Clinical evidence of lymphadenopathy usually precedes signs of bone involvement by a few months to a few years, but Blount¹ in 1929 reported a case in which involvement of the spine and shoulder preceded the general enlargement of the lymph-nodes, while more recently cases have been reported by Krumbhaar² and Livingston³ in which the lymph glands were not involved at necropsy, although definite Hodgkin's disease existed in the bone. These cases, although few, must be accepted as evidence in favour of the possible primary nature of the osseous lesions. Favorite sites for the bone lesions are the spine, pelvis, sternum and skull, with the ribs, humerus, femur and clavicle showing less frequent incidence.

No special symptoms appear to point to bone involvement, although pain, due to bone necrosis, pressure on nerves or actual invasion of nerve roots may be expected in about half the cases, while signs of cord compression and girdle pains are commonly observed in lesions of the vertebræ. Spontaneous fractures have been reported.

Pathologically, the bone lesions would appear to conform to four distinct types: (1) pressure erosion from enlarged lymph-nodes due to mechanical interference with the blood circulation in the periosteum, and characteristically observed in the dorsal spine; (2) granulomatous periostitis following rupture of the capsule of an adjacent Hodgkin's lymph-node, as seen in sternal and rib involvement; (3) invasion of the medulla and replacement of the marrow by tissue identical in composition with that of

Hodgkin's lymph-nodes, resulting in loss of bone density and disintegration of bone structure. This latter, and commonest, type is usually associated with considerable pain of a boring character, unrelieved by rest, in contradistinction to the pain of bone tuberculosis. The fourth type of osseous change in Hodgkin's disease is of the nature of a hyperplasia, characterized by an increase of the cells normally manufactured there, resulting in increased density.

As ably demonstrated by Craver and Copeland⁴ in their recent comprehensive review of this subject, radiographic changes may frequently be observed in bones without any clinical evidence of such involvement, and warrant routine x-ray studies of the skeletal system. While roentgenological changes usually appear early, evidence of the disease in bone has been found at autopsy without demonstrable radiographic changes. Most often the bone first assumes a mottled appearance, due to replacement of the spongiosa by granulomatous tissue. This is followed by a decrease of density representing focal necrosis. Occasionally larger areas of destruction develop and present the typical appearance of neoplasm. Erosion of the cortex suggesting pressure has been observed, while gross thickening and lifting of the periosteum is the usual picture seen in rib and sternal involvement. Osteoplastic changes have been reported in relatively few instances, rarely as a separate process, oftener as a zone of defence circumscribing a destructive process, and always probably representing the reparative efforts in a more chronic process. In the vertebræ, destruction and collapse are the rule, with frequent multiple involvement, but the disk cartilage usually remains intact.

In the differential diagnosis, metastatic carcinoma bears the nearest resemblance especially to the purely osteolytic types which may be indistinguishable roentgenologically. In lesions showing some osteoplasia differentiation must be made from malignancy secondary to the prostate, breast, kidney and thyroid, in which case a primary tumour should be searched for. Periosteal types of involvement eliminate the probability of carcinoma, but here Ewing's tumour and syphilis must be ruled out, as all may show laminated periosteal proliferation with lifting. In infants leukæmic involvement of bone may be manifested by periosteal thick-

ening due to lymphatic proliferation beneath the periosteum and replacement of the bone marrow by similar tissue. Here however the lesions are more uniform and symmetrical and may involve all the long bones, including the phalanges, while the blood picture is characteristic. Bone changes due to lymphosarcoma also may be manifested by irregular condensation with pseudo-cystic areas or erosion and very little new-bone formation, and may require biopsy for differentiation. A chronic inflammatory process must be ruled out, while erosion of the dorsal vertebræ by aneurysm may closely resemble that due to enlarged Hodgkin's lymph-nodes.

Prompt relief from pain is to be expected in most cases after roentgen therapy. Brailsford² reported that the more prompt response to x-radiation may be used to differentiate the lesions from carcinoma, while continued treatment may result in bone regeneration to the degree of consolidation after spontaneous fractures. The process however is frequently a diffuse one, and poverty of blood often precludes adequate radiation of the lesions.

Considering our knowledge of the bone manifestations of this disease in the light of the infectious and neoplastic theories concerning its nature, it must be admitted that in both Hodgkin's disease and the various forms of chronic osteitis and infectious granuloma we see areas of destruction surrounded by sclerosis and, except in tuberculosis, new bone formation. However, the predominant incidence of bone infections in childhood, the usual history of acute onset, with clinical evidence of pain and fever, the tendency to abscess formation, sequestration and frequent periosteal and epiphyseal involvement, are all features characteristic alone of bone infection. In Hodgkin's disease the intervertebral disk cartilage remains intact, whereas it is usually the seat of early fragmentation and destruction in an inflammatory lesion. Moreover, an infectious process fails to yield to moderate irradiation or becomes aggravated, whereas a prompt response is the rule in Hodgkin's bone lesions and a feature more in common with chronic malignant affections. The distribution of the bone lesions in Hodgkin's disease is in accordance with that observed in metastatic carcinoma, while the occurrence of pathological fractures is a feature common to both processes. It is true that bone sarcoma

usually metastasizes *via* the blood stream to the lungs and that the occurrence of lymphatic involvement in association with the bone lesions is more in keeping with an inflammatory disease, but this point is subject to further evaluation pending knowledge concerning the sequence of these manifestations.

The evidence as presented therefore shows a decided leaning to the neoplasm theory. A neoplasm may be defined as a cell proliferation which serves no useful purpose and does not represent a defence reaction to a foreign agent. The commonly recognized forms are essentially lesions of a local group of cells for an initial portion of their clinical course, but in lymphosarcoma, the leukæmias and the Hodgkin's group, the frequent involvement of the liver, spleen, lymph-nodes and bone marrow in various sequence warrants consideration of a hypothesis of neoplasm of a whole system of cells, such as the reticulo-endothelial system, and that any area where such tissue is found, including the bone marrow, may be the primary focus for the disease. On this basis one can reconcile the apparent exception to the rule of primary bone malignancy being a single lesion. This conception regarding the nature of Hodgkin's disease permits consideration of the periosteal and pressure erosion types of involvement as direct extension processes, while the associated lymphatic and visceral lesions represent accessory primary foci.

The following cases* demonstrate the multiple malignant characteristics of Hodgkin's disease and are of interest from a roentgenological aspect.

CASE 1

G.S., male, aged 1 year, was perfectly well until six months previously, when he fell off a table, hitting his head on the floor. A large swelling about two inches in diameter and non-fluctuating appeared over the left temporal region and remained constant in size. There was no ptosis or lymphadenopathy. Roentgenological studies of the head demonstrated definite rarefaction of the temporal bone in the temporal fossa at the origin of the zygoma. There was complete loss of definition of the malar bone and the developing upper teeth seemed to be resting without bone foundation in the upper maxilla. There was no evidence of aeration of the sinuses and apparent destruction of the antral wall. Studies one month later (Fig. 1) revealed large sharply defined areas of rarefaction of both tables in the mid-parietal zone on the right side. The appearance at this time suggested neoplastic invasion, possibly arising from the choroid and extending back along the optic nerve, involving the sella and with direct or metastatic extension into the surrounding bone. The radiographic appearance of this

* From the records of University Hospital, Ann Arbor, Mich.

lesion was considered essentially neoplastic in character rather than inflammatory. All the laboratory examinations were negative. Two weeks after the demonstration of the bone lesions, the swelling appeared larger, and slight enlargement of the posterior cervical lymph-nodes was noted on the left side. A biopsy of the posterior cervical glands was reported on by Dr. C. S. Weller as "atypical Hodgkin's disease" or so-called sarcomatous Hodgkin's. The child's condition grew steadily worse. Large swellings appeared on the neck, the face became swollen, and the whole body covered with petechial hæmorrhages, followed soon after by death. The post-mortem diagnosis was sarcomatous Hodgkin's disease, with neoplastic infiltration of periosteum and substance of the parietal, temporal, sphenoid and zygomatic bones.

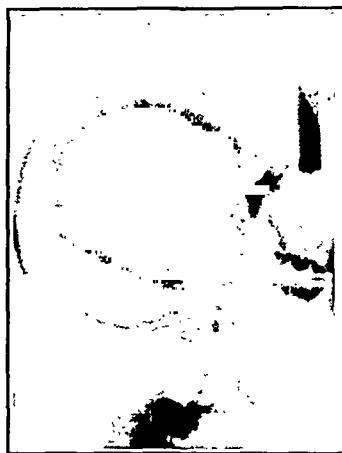


Fig. 1



Fig. 2



Fig. 3

CASE 2

R.N., male, aged 69, complained of dyspnoea, cough, œdema of legs, swellings in axillæ and groins for two months with 15 lbs. loss of weight. Physical examination showed enlarged cervical, axillary and inguinal glands varying in size from one to three cm., some in the groin being the size of an egg. The liver was enlarged, the lower border being 10 cm. below the costal margin. Both extremities were œdematous. Laboratory studies showed a moderate secondary anæmia and a relative lymphocytosis. X-ray examination of the chest revealed a non-pulsating tumour mass in the mediastinum and bulging of the first portion of the aortic arch.

Deep x-ray therapy resulted in a marked diminution of the mediastinal shadow and of the enlarged glands in the cervical, axillary and inguinal regions. The patient was sent home with the œdema relieved and his general condition greatly improved. He returned two months later with a recurrence of symptoms, became gradually weaker, and died six months after the onset of symptoms. The post-mortem findings were sarcomatous Hodgkin's disease, marked enlargement of retroperitoneal lymph-nodes, less marked hypertrophy of the mediastinal and superficial nodes, and metastases in the liver. The first portion of aortic arch was moderately dilated, and a large circular growth was attached to the posterior aspect of the sternum, with marked associated periosteal proliferation.

CASE 3

O.G., male, aged 19, reported swelling of the neck for 1½ years before admission to hospital. Examination revealed moderately enlarged cervical and inguinal lymph-nodes. Biopsy of a cervical node showed Hodgkin's disease. Three months later he developed kyphosis at the level of the twelfth dorsal vertebra, also a limp and pain in left hip and knee. X-ray studies at that time revealed a destructive process of the twelfth dorsal vertebra (Fig. 2) and in the left sacro-iliac synchondrosis (Fig. 3).

A plaster cast was applied and x-radiation given to the spine, chest and pelvis, resulting in a marked decrease of pain. The patient died 11 months after recognition of the bone lesions. No post-mortem studies were available.

COMMENT

The desirability of routine roentgenological studies of the skeletal system in Hodgkin's disease is most obvious, not only because of the frequency of bone involvement but also to enhance our knowledge concerning the sequence

of changes and general nature of this obscure disease, whose key may well be that of the whole problem of cancer. A knowledge of the generalized character of disease permits the radiotherapist to recognize and investigate atypical symptoms at an early stage and apply suitable treatment.

SUMMARY

1. The present status of our knowledge concerning the nature of Hodgkin's disease is reviewed.
2. Bone involvement in Hodgkin's disease is discussed, the deductions pointing to a neoplastic conception of the disease, possibly primary in bone in some instances.
3. Cases of Hodgkin's disease are reported showing the following features: apparent onset of the disease in the skull; multiple involvement of bone, and medullary and periosteal types of the process.

REFERENCES

1. BLOUNT, W. P.: Hodgkin's disease an orthopaedic problem, *J. Bone & Joint Surg.*, 1929, 11: 761.
2. BRAILSFORD, J. E.: *The Radiology of Bones and Joints*, Churchill, London, 1st ed., 1934, p. 343.
3. CRAVER, L. F. AND COPELAND, M. M.: Changes in the bone in Hodgkin's granuloma, *Arch. Surg.*, 1934, 28: 1062.
4. EWING, J.: *Neoplastic Diseases*, Saunders, Phila., 2nd ed., 1922.
5. GORDON, M. H.: *Rose Research on Lymphadenoma*, Wood, Baltimore, 1933.
6. KRUMBHAR, E. B.: Is typical Hodgkin's disease an infection or a neoplasm? *Am. J. M. Sc.*, 1934, 188: 596.
7. KRUMBHAR, E. B.: Hodgkin's disease of bone marrow and spleen without apparent involvement of lymph nodes, *Am. J. M. Sc.*, 1931, 182: 764.
8. LIVINGSTON, S. K.: Hodgkin's disease of the skeleton without glandular involvement, *J. Bone & Joint Surg.*, 1935, 17: 189.
9. MEDLAR, E. M.: An interpretation of the nature of Hodgkin's disease, *Am. J. Path.*, 1931, 7: 499.
10. WARTHIN, A.: The genetic neoplastic relationships of Hodgkin's disease, aleukemic and leukemic lymphoblastoma, and mycosis fungoides, *Ann. Surg.*, 1931, 93: 153.
11. WELCH, J. E.: Tumour of neck showing unusual histological features, *Proc. N. Y. Path. Soc.*, 1910, 10: 161.

OXYCEPHALY, WITH THE REPORT OF TWO CASES IN
A BROTHER AND SISTER

BY DAVID L. KLEIN, M.D., D.P.H. AND A. E. CHILDE, M.D.,

*Children's Memorial Hospital,**Montreal*

OXYCEPHALY, often referred to by the vague term "tower skull", is a condition associated with premature synostosis of the cranial sutures, giving rise to abnormal development of the skull and hindrance to the normal expansion of the growing brain. Greig,⁶ in his extensive monograph on the subject, makes clear the distinction between true and delayed oxycephaly and what he terms "false oxycephaly". True oxycephaly is recognizable at birth. There is a general cranio-facial synostosis which is often associated with syndactyly and allied deformities of the extremities. The disturbance is embryonic and takes place during the formation of the fingers. It may continue to that period of development when the joints are being completed, thus accounting for some degree of limitation of joint movement. The exaggerated cranial deformity is produced by the rapid growth of the brain in infancy exerting its force against a skull whose sutures are undergoing premature and complete obliteration. The cranial involvement is the essential feature of this clinical entity, while the somatic defects may be entirely absent.

Delayed oxycephaly manifests itself in childhood. In this type it is uncertain if the facial sutures participate in the premature cranial synostosis. The objective signs and symptoms are less marked, and there are no concomitant deformities of the extremities. False oxycephaly presents premature synostosis of one or a few of the cranial sutures. There is no involvement of the base of the skull and there are no abnormalities of the extremities. In contrast to the condition under discussion, microcephaly presents premature synostosis of the sutures for an entirely different reason. In the latter, the sutures become obliterated because of the cessation of brain growth, and there is no evidence of the adjustment of the skull to a

brain growing under the abnormal condition of premature synostosis.

We present two typical cases of true oxycephaly, which are of special interest since they occurred in a brother and sister.

CASE 1

L.B., a female Hebrew child, aged two and a quarter years, was brought to the Out-patient Department of the Children's Memorial Hospital on June 27, 1933, and was admitted for routine investigation. The child had not been well for the previous five weeks. She looked tired, and complained of a tired feeling, most of the time. Her appetite was poor and she coughed occasionally. There was no history of headache, vomiting, vertigo, or convulsions.

Past history.—The patient was born at full term, by normal delivery, weighing six and a half pounds. A lump was present on the head at birth (probably a caput succedaneum). She was breast fed up to three months, when artificial feeding including two teaspoonfuls of cod liver oil was instituted. At two months of age a physician was consulted because the "head was high", but no significance was attached to this feature. At eight months of age she was admitted to another hospital for x-ray treatment for an enlarged thymus. At this time the head was described as normal in shape. The fontanelles were closed and there was no evidence of craniotabes. She walked at nine months and talked at thirteen months. She had had chicken-pox and one attack of urticaria.

Family history.—Both parents are of only fair intelligence. The father is thirty-six years of age and has been married twice (Cases 1 and 2 are children of the second marriage). The mother, the second wife, is thirty-four years of age and is in good health. One half sister, fourteen years of age, presents definite stigmata of degeneration. Her face is asymmetrical; she is short-sighted and has some degree of exophthalmos. Her right eye is more prominent and on a slightly higher plane than the left. The eyes are said to have been more prominent in early childhood. Radiograms of her skull show no signs of oxycephaly. One sister, aged seven and a half years, is normal, and radiograms of her skull show no signs of oxycephaly. One brother (Case 2) is definitely oxycephalic. The eyes of the maternal grandmother and great-grandfather are said to have been prominent, but a photograph of the former does not corroborate this statement.

Physical examination.—The height was thirty-four inches and the weight 25 pounds. Exophthalmos, the most striking feature, was particularly marked in the right eye. It was associated with a rather heavy-lidded expression,² quite unlike that seen in exophthalmic goitre. The movements of the eyeballs were normal, and there was no strabismus or nystagmus. The pupils were centrally placed and reacted to light and accommodation. The conjunctivæ were clear and did not present an icteric tinge. The child reacted quickly to questions, had the average intelligence for her age, and apparently could

see and hear. The head was brachycephalic, and had a cephalic index of 86. The occipito-frontal circumference was seventeen and three-quarters inches. Palpation of the cranial vault revealed some interesting findings. The metopic suture line (the suture between the two halves of the frontal bone in the new born) jutted out slightly. It was keel-like and sharp in its lower portion but broader at its upper end. The bregma projected upwards as a smooth, round, bony prominence, the size of a large marble. The sagittal suture line bulged slightly in its entire length. There was some degree of outward bulging in the region of the temporal fossa on each side. The sites of the posterior fontanelle and of the lower ends of the coronal suture could be felt as distinct grooves less than one-sixteenth of an inch in depth. No soft areas could be felt in the vault of the skull. There were no distended veins in the forehead and scalp. The teeth were normally arranged in both jaws. There was some dental caries, but no prognathism of the lower jaw.

The epitrochlear and inguinal glands were palpable on both sides; they were small, firm, and discrete. The thorax was symmetrical. There was no evidence of past rickets. The cardiovascular system, lungs, and abdomen were normal. The cranial nerves, excepting the optic nerves, were normal.

Radiographic findings.—The skull was definitely small for the age. The convolutional markings were greatly exaggerated over the entire vault, which was thinner than normal. The suture line between the basilar portion of the occipital bone and the body of the sphenoid was of normal width. None of the remaining suture lines were seen, and all appeared to have closed completely. The upward projection of the bregma and the outward bulging in the regions of the temporal fossae were pronounced (Fig. 1).

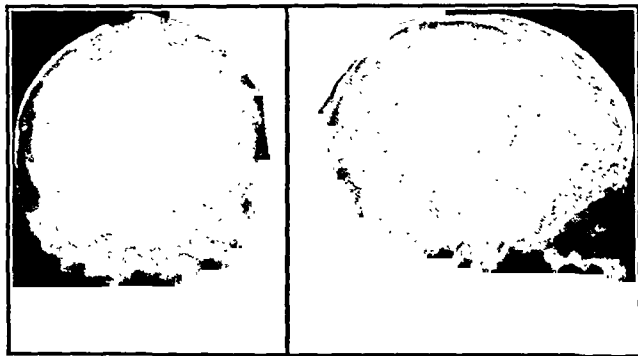


Fig. 1

Fig. 2

Fig. 1.—Skull in Case 1, showing exaggerated convolutional markings and bulging of the bregma and temporal fossae. Fig. 2.—Skull in Case 2, showing extremely pronounced convolutional markings and united sutures.

Laboratory tests.—*Blood count:* red blood cells, 4,850,000; white blood cells, 8,200; blood Wassermann test negative. *Intradermal tuberculin* (1:1,000), negative.

Special examinations.—Ophthalmoscopic examination revealed papillædema of both optic discs and dilatation of the veins.

A lumbar puncture was performed, the patient lying on her side, without the preliminary administration of hypnotics. Clear spinal fluid was obtained under pressure, amounting to 350 mm. of water. As the child was crying during the operation, the process was repeated two days later after the administration of nembutal and morphine. At this time the spinal fluid pressure was 220 mm. of water. The fluid was clear and contained one cell per c.mm. The Pandy test was negative. The chlorides were 795 mg. per 100 c.c., and the total proteins 0.021 per cent.

CASE 2

P.B., a brother of Case 1, aged three and a quarter years, was brought to the hospital at our request, but the parents would not consent to his admission to the ward. The history was essentially negative apart from the fact that he had presented a "high head" and bulging eyes since birth. His intelligence was good. He saw and heard well. Since he bears a striking resemblance to his sister (Case 1) we will give only a short summary of his condition. He presented the same type of exophthalmos but the protrusion was equilateral. Ophthalmoscopic examination revealed normal optic discs.

The boy's head was practically a replica of his sister's. In his case, however, the keel-like projection of the metopic suture was somewhat broader and there was a greater degree of bulging of the temporal fossae. The radiograms of the skull showed that the convolutional markings were even more pronounced than those of his sister. The cranial vault was very thin and all its sutures appeared to be completely united (Fig. 2).

DISCUSSION

The cause of this disease is still unknown. The presence of syphilis is rarely demonstrated serologically.⁴ Rickets as a causative factor has been denied by many observers.^{4,1} Bronfenbrenner¹ holds that various intracranial infectious processes appear to be the main etiological factors in the premature cranial synostosis of oxycephaly and allied deformities of the skull. He suggests that tuberculosis and the degenerative phase of syphilis (in which the Wassermann test is negative) may play a rôle in the causation.

Greig found that the great majority of the cases recorded in the literature were isolated instances in a family. He knows of no cases of transmission to the third generation, although transmissions from a parent to one or more children have been recorded. He holds that true oxycephaly is an embryological disturbance, and that it might be inherited, that delayed oxycephaly may be congenital, and that, in rare instances, this form has been proved hereditary. Greene⁵ suggests that, so far as cranial abnormalities are concerned, oxycephaly is a variation resulting from a displacement or division of primary ossification centres controlled by hereditary factors. Our investigation of Case 1 could not establish the presence of tuberculosis or syphilis.

It is possible that the premature ossification at the base of the skull holds the bones of the cranial vault rigid. Consequently, brain growth takes place in an upward direction and bulging occurs at the vertex. Greig's description of the mechanism involved in the production of the cranial deformity is extremely interesting.

Under normal conditions the metopic suture is the first to undergo obliteration in extra-uterine life. This is a gradual process, and, except for persisting traces at the upper and lower limits of the suture, is complete by the 5th or 6th year. (It persists in its entire length until adult life in about 8 per cent of Europeans).³ Synostosis of the sutures in the cranial vault of the adult begins about the age of 30, commencing in the coronal and following later in the sagittal and lambdoid sutures. The order and time of this occurrence is however, subject to some degree of variation. Complete obliteration of all sutures does not normally occur until advanced age. Thus, there is ample provision for growth and expansion of the brain. On the other hand, in oxycephaly synostosis occurs prematurely, in infancy or childhood, when brain growth is most rapid. According to Greig, one suture becomes obliterated first, and its site is marked by a persistent groove on the surface of the skull. This prevents the normal expansion of the brain, which can therefore only expand along the lines of least resistance. The skull gives way at its weakest points. The sutures which are not yet obliterated are actually forced apart, and the intracranial tension causes the membranes in the gaping sutures to bulge outwards. Ossification of these membranes persists as the prominences at the bregma and the keel-like projections at the site of the sutures that are later in closing. This increase of tension was shown in the raised spinal fluid pressure of Case 1. It forces the inner table of the skull against the diploe, which becomes compressed and produces the increased convolutional markings that are seen in the radiograms. The orbital plates are forced downwards, giving rise to shallow orbital cavities and exophthalmos which may be more marked on one side than on the other.

Symptoms due to increased intracranial pressure are seldom reported, even in the acute stage when the pressure should reach its maximum. Bronfenbrenner suggests that the absence of complaint may be explained by the fact that the disorder usually begins at an early age when the subjective symptoms can hardly be interpreted. It is obvious that the patient can only be of average mental capacity at the

best. The majority are somewhat below the average. Disorders of hearing and smell are reported in a negligible number of cases, and, according to Greig, the optic is the only cranial nerve that seems to be involved. Statistics on the association of impairment of vision in this disease are often misleading, since it is likely that they include cases of false oxycephaly free from ocular disturbance. Greig holds that visual impairment must be more common than statistics indicate. In neither of our cases did we detect impairment of vision, and in only one case did we find œdema of the optic discs. We must admit, however, that both of the children were at an age when examination of the finer perceptions of the eyesight could not be investigated accurately. One would expect our first patient, in particular, to develop gradual impairment of vision and possibly total blindness if no treatment is instituted. We have recently seen another case with all the radiological features of oxycephaly, in a boy of sixteen years of age, who is almost completely blind.

The treatment lies within the scope of neurosurgery. Decompression may be performed to reduce intracranial pressure.

SUMMARY

A description of two cases of true oxycephaly, in a brother and sister, is presented from the standpoint of clinical interest. In spite of the obvious cranial deformity, the afflicted children had no complaints that would attract the attention of the examiner to the site of trouble. The diagnosis was established by the signs elicited on physical and radiographic examination.

It has been suggested that oxycephaly may be hereditary, and we feel that these two cases tend to support this theory.

We wish to thank Drs. Wilder Penfield, W. V. Cone, R. R. Struthers, and S. Graham Ross for their kind cooperation and assistance.

REFERENCES

1. BRONFENBRENNER, A. N.: Oxycephaly as a pathogenetic entity, *Am. J. Dis. Child.*, 1931, 42: 837.
2. CARR, A. D.: Oxycephaly, *J. Missouri State Med. Ass.*, 1929, 26: 398.
3. CUNNINGHAM's Text-Book of Anatomy, 4th ed., Wm. Wood, N.Y., 1917, p. 115.
4. DOCK, G.: Oxycephaly and exophthalmos, Contributions to Medical & Biological Research Dedicated to Sir Wm. Osler, P. B. Hoeber, N.Y., 1919, 4: 433.
5. GREENE, H. S. N.: Oxycephaly and allied conditions in man and in the rabbit, *J. Exper. Med.*, 1933, 57: 967.
6. GREIG, D. M.: Oxycephaly, *Edin. M. J.*, 1926, 33: 189.

PROTAMINE INSULIN*

BY R. B. KERR, C. H. BEST, W. R. CAMPBELL AND A. A. FLETCHER,

Toronto

VERY soon after insulin became available it was established that a given amount of the active material produced the most favourable effects upon the hyperglycæmia and glycosuria of depancreatized dogs when it was administered frequently in small doses. These observations were soon confirmed in the clinic, but it was found possible to treat most cases of diabetes satisfactorily with two or three injections of insulin daily. The explanation of the fact that small doses produce relatively greater effect than larger ones is not completely clear, but, among the factors responsible, the excretion of greater amounts of insulin by the kidneys and destruction by enzymes present in the tissues when the larger doses are administered may be mentioned. As the purity of insulin increased the duration of the physiological effects produced by its injection was shortened. More clinical cases came to require three to four doses daily.

The purification of insulin, although diminishing the local reaction at the site of injection, has not improved it as a therapeutic agent. As a result of this situation, a great many efforts have been made to prolong its action by combining it with a wide variety of substances, but no conspicuous success was obtained before the work of Hagedorn, Jensen, Krarup and Wodstrup.¹ Their investigations have demonstrated in a very convincing fashion the effectiveness of certain protamines in delaying the absorption of insulin. It may be mentioned here also that our colleagues, Dr. D. A. Scott and Dr. Albert Fisher,² of the Connaught Laboratories, have reported success in laboratory animals by the addition of zinc salts to insulin solutions, but these results have not as yet been applied in clinical medicine.

PHYSIOLOGICAL ASPECTS

In the preparation of protamine insulin† for injection, a suitable quantity of protamine, buffered with sodium phosphate, is added to regular insulin. This forms a fine, flocculent

precipitate which, after shaking, may be injected like regular insulin. The compound of protamine and insulin is not stable indefinitely and should be used within ten days of its preparation.

Protamine insulin has now been steadily used for several months on four depancreatized and several normal dogs. Solutions of insulin to which zinc has been added have been tested on normal dogs. The results of the administration of protamine and zinc insulin may be briefly summarized as follows.

(1) It is possible to maintain depancreatized dogs, which are provided with a very liberal diet, sugar-free and in excellent condition on one dose of protamine insulin daily. (2) The glycosuria is much greater when one dose of regular insulin is administered daily than when the same number of units of this insulin combined with protamine is given in a single dose. (3) A very large dose of protamine insulin may be administered, and the blood sugar may be kept at very low levels for long periods (18 to 30 hours) without the production of hypoglycæmic reactions. It would appear that insulin is liberated from the protamine combination at such a rate that its effects can be effectively counteracted by the hepatic glycogenolysis produced by such factors as the outpouring of epinephrine, which is known to take place when the blood sugar is reduced to certain levels. (4) In confirmation of the results of Scott and Fisher, we have noted that the addition of zinc to regular insulin or to purified protamine and insulin solutions results in a prolonged insulin action in

* From the Departments of Physiology and Medicine, University of Toronto, and the Medical Service, Toronto General Hospital.

† The first protamine used in this work was very kindly supplied to one of us (C.H.B.) by Professor Hagedorn. More recently, the sperm of the British Columbia salmon, collected by the Pacific branch of the Biological Board of Canada, has provided a source from which very satisfactory protamine has been made available by the Connaught Laboratories.

normal dogs. It may be, as Scott and Fisher have suggested, that zinc or other metals play a part in the union between protamine and insulin. These workers have pointed out that both the regular protamine preparations and commercial insulin contain appreciable amounts of zinc, and that diminution of the ash content of protamine and insulin reduces the duration of the hypoglycæmia effect when the compound of these purified materials is injected.

There are obviously a number of points which require further investigation before protamine insulin can be advantageously used by the medical profession. A large supply of a uniform and well standardized protamine preparation should be available.* It may be possible to mix the insulin and protamine before sending out the material and to add only the buffer solution just before the protamine insulin is used. This procedure has certain advantages over that tentatively adopted, from the standpoint of sterilizing and preventing the contamination of the protamine solutions. If a method of stabilizing the protamine insulin compound is found the necessity of distributing two separate solutions will be avoided.

CLINICAL ASPECTS

Over a period of two years Hagedorn and his co-workers have treated with protamine insulin 85 diabetic patients in various age groups and showing varying degrees of severity, with very satisfactory results. The principal claim for the superiority of protamine insulin over regular insulin rests on the prolongation of its action, as shown by the blood sugar curve, its effect on glycosuria, and on the ammonia excretion as a measure of acidosis, together with an increase in the feeling of well-being of the patient. This would constitute an important improvement in present-day treatment of the diabetic and, happily, can be confirmed by the work of Root, White, Marble and Stotz,³ and by our own investigations.

This preliminary report is based on results of an experience with 25 cases. We are agreed that following the administration of protamine insulin the blood sugar curve is not lowered so precipitately as with regular insulin, but slopes

off more gradually, is less likely to pass below normal levels, and rises slowly to previous levels. The duration of the curve is two to three times as long as when a similar dose of regular insulin is used. When patients receiving regular insulin are allowed to have a moderate glycosuria, the substitution of an equal dose of protamine insulin causes diminution in the glycosuria, ketosis improves, and the patient's feeling of well-being is definitely more marked.

In the severe, the juvenile, and the so-called unstable diabetic patients, reactions due to hypoglycæmia have been frequent when regular insulin has been used. These are found to be much less frequent with protamine insulin. We would regard this as one of the outstanding advantages of the new product. Hagedorn has pointed out, however, that when treatment with regular insulin gives satisfactory results, the use of protamine insulin is of no special value and, indeed, in conditions where more rapid action is desirable, such as in coma, the regular insulin is to be preferred.

Protamine insulin has presented new problems in the administration of insulin in regard to the number of doses necessary, the amount suitable, the timing in relation to meals, and other factors, such as its use in combination with regular insulin. Hagedorn, Jensen, Krarup and Wodstrup have used a wide variety of modes of administration, but seem to favour the administration of a dose of regular insulin in the morning and an evening dose of protamine insulin. Root, White, *et al.* have likewise treated most of their cases in this manner with successful results. Whilst we have found this mode of administration to be satisfactory in many instances, in others different adjustments of dosage and combinations of regular and protamine insulin appear to be more effective in the control of some cases of diabetes. Further experience with protamine insulin is required before general rules for its use can be formulated.

In conclusion, protamine insulin gives promise of being an important contribution to the restoration of a more physiological state in the diabetic patient.

REFERENCES

1. HAGEDORN, H. C., JENSEN, B. N., KRARUP, N. B. AND WODSTRUP, I.: Protamine insulinate, *J. Am. M. Ass.*, 1936, 106: 177.
2. SCOTT, D. A. AND FISHER, A. M.: The effect of zinc salts on the action of insulin, *J. Pharm. Exp. Therap.*, 1935, 55: 206.
3. ROOT, H. F., WHITE, P., MARBLE, A. AND STOTZ, E. H.: Clinical experience with protamine insulinate, *J. Am. M. Ass.*, 1936, 106: 180.

* We are informed that protamine insulin will probably not be available in the Connaught Laboratories for general distribution before the late summer or early autumn of this year.

MESENTERIC LYMPHADENITIS IN ADOLESCENTS SIMULATING APPENDICITIS

By DONALD C. COLLINS, M.D., M.S.(IN PATH.), M.S.(IN SURG.),

Los Angeles, Calif.

THE possible presence of mesenteric lymphadenitis must be considered when making a pre-operative diagnosis of acute appendicitis in adolescents. In an experience of 2,140 appendectomies for acute appendicitis this pathological entity was met with in 43 (2 per cent) instances; 26 (60.5 per cent) of these cases occurred in females. The average age of the individuals in this series was 12.3 years, while the extremes varied from 4 to 20 years.

It was formerly believed that mesenteric lymphadenitis was primarily caused by the tubercle bacillus obtained from the ingestion of infected cow's milk. This was subscribed to by Struthers⁸ in 1921. The first authoritative and comprehensive article upon this subject was contributed by Wilensky and Hahn¹⁰ in 1926, who reported eight cases. They pointed out that this disease was a definite clinical syndrome which was easily mistaken for and should be differentiated from acute appendicitis, "abdominal grippe", ureteral stone, intestinal parasites, typhoid fever, acute gastroenteritis and acute diverticulitis. The pyogenic variety was considered as being distinct from the tuberculous type. If a diagnosis could be made, they urged that conservative treatment was indicated, except in the suppurative type. McFadden,⁴ in the following year, added additional cases to the literature. They were predominantly of the chronic tuberculous type. Brenneman¹ was one of the first to direct serious attention to the rather high incidence of upper respiratory infections and acute pharyngitis associated with appendicitis in children. In 1929 Speese⁷ reported additional instances of this disease and presented an excellent review of the literature. He believed that tuberculosis was infrequent as an etiological factor. It was his contention that mesenteric lymphadenitis was secondary to appendicitis, because he had noted the frequent occurrence of enlarged mesenteric lymph nodes in association with chronic appendicitis. Lamson,³ in 1931, de-

scribed a case in which an acute purulent appendicitis co-existed with marked mesenteric lymphadenitis. He did not believe that tuberculosis commonly caused this disease. Appendicitis, enteritis, and ulcers of the ileum were held to be the usual causative etiological factors of this pathological entity. Simple exploratory laparotomy was thought to be a valuable empiric curative procedure. Rockey⁶ added 4 case reports in 1933. During this same year, Wile and Saphir,⁹ in an effort to explain the causation of the condition, advanced the theory of *Durchwanderung* of organisms through the bowel wall to the lymphatic channels leading to the regional mesenteric nodes, a theory which has been largely rejected by subsequent writers upon this subject. The patients whom they described were so acutely ill and had such a high mortality rate that one questions if they were really describing common instances of the condition. Goldberg and Nathanson,² in 1934, presented an excellent study of this condition: 19 cases were tabulated and 16 of these were operated upon. They directed attention to the high incidence of concurrent *S. hemolyticus* infections in the throats of these patients. In case of doubt, exploratory laparotomy was urged as the rational treatment. They had no operative deaths. Pribram⁵ directed attention to the characteristic pain which usually is localized in the umbilical region. He claims that this symptom is diagnostic of this disease. Tonsillectomy was found to bring about often a permanent cure, whereas simple appendectomy alone was frequently followed by remissions.

The typical case history of this disease is somewhat as follows.

A girl, aged twelve years, who has had previous afebrile attacks of mild generalized abdominal pain of short duration, is suddenly seized with a rather severe generalized crampy abdominal pain associated with fever, which after a period of 10 to 18 hours localizes its point of maximum tenderness in the region about the umbilicus, or more often to the left of it. The attack usually begins about the time of the expected menstrual period. Commonly, this is the second or third menstrual period that the patient has had and the periodicity of the

menses is as yet poorly established. Often, she has had an attack of posterior pharyngitis or tonsillitis 7 to 10 days previously, which forced her to go to bed for a day or so. Since then she has not felt entirely well. She frequently vomits several hours after the onset of the abdominal cramps, but obtains little relief. Diarrhœa may occur after the onset of symptoms, but little symptomatic improvement results. Due to the chronicity of the abdominal complaints the parents fail to bring the patient to the doctor until 10 to 18 hours have elapsed since the onset of symptoms. Commonly a cathartic has been administered by the parents, but it has only aggravated the abdominal complaints.

The physical examination commonly reveals a healthy, robust-looking girl who does not impress one as being acutely ill. The throat and tonsils occasionally may show little of significance. However, the tonsils usually fall into the category of the large, hypertrophied, grossly infected type, in which large plugs of pus can be expressed from the crypts. A chronic posterior pharyngitis is commonly found. Posterior cervical lymphadenopathy is present in a majority of cases. The heart and lungs are usually negative, although some few subsequently develop endocarditis. The abdomen is often moderately distended. Palpation gives one the impression of its being slightly doughy. Moderate diffuse abdominal tenderness is the rule, with some localization in the umbilical region or to the left of it. Localized rigidity is seldom encountered in the right lower quadrant, and evidence of parietal peritoneal irritation is seldom marked. With the patient's attention diverted, deep abdominal pressure can commonly be tolerated without great discomfort. The rapid localizing phenomena usually seen in acute appendicitis are less apparent in this disease. The classical signs and symptoms of appendicitis are either not clear cut or may be absent. Rectal examination often elicits a tender area high in the right pelvis or more towards the left side.

In our series of 43 cases, the temperature per rectum ranged from 99.2 to 104.4° F., the average reading being 101.3°. The pulse was quite full and of good character. It averaged 86 beats per minute, with extremes from 68 to 124. The respirations averaged 18 per minute. Posterior cervical adenopathy was present in 28, or 65.1 per cent. The average leucocyte count was 11,840, with 68 per cent polymorphonuclear neutrophils of an immature poorly segmented character, 24 per cent small lymphocytes, 4 per cent large lymphocytes, 3 per cent polymorphonuclear eosinophiles and 1 per cent polymorphonuclear basophiles. The urine examination was usually negative, but there might be a trace of albumin and 10 to 20 pus cells per high-dry field in the centrifuged specimen. The blood Wassermann test was negative. Specific blood agglutination tests for *Brucella* infections were negative. The Widal test was likewise negative. Three, or 6.9 per cent, subsequently developed endocarditis. In other words, the entire clinical picture impresses the physician with the atypical character of the symptoms and signs. These are

milder in character and less clear-cut than those commonly seen in acute appendicitis. However, because of the possibility that this train of mild atypical symptoms and signs may be due to appendicitis the physician cannot honestly recommend watchful waiting to the parents. If he has had an extensive experience he can recall several instances in which abdominal exploration revealed an acute fulminating appendicitis.

Abdominal exploration being decided upon as the only safe rational course of procedure, a nitrous-oxide-ether or ethylene anaesthesia is given. A mid-right rectus incision is made and the peritoneal cavity is opened. Inspection and palpation reveal that the appendix is not the primary cause of the symptoms. The mesentery of the ileum, and especially its terminal portion, is markedly thickened, œdematous, and filled with inflamed, greatly enlarged, often matted-together, mesenteric lymph nodes. The ileum and its mesentery are hyperæmic, and there is a definite increase in the vascularity of that region.

The probable diagnosis having been made, the question arises as what will be the best course of treatment to follow. A representative lymph node should be removed and sent to the pathologist for an immediate frozen-section diagnosis. If tuberculosis or some type of malignancy is found the appendix should not be disturbed and the abdomen should be closed without drainage. If the pathologist reports that the node examined reveals only inflammation, two courses of action are open to the surgeon. If signs of an acute recent inflammatory or suppurative process are present appendectomy should not be done. However, this is not the usual case, and the evidence points to the chronicity of the process. In the latter case appendectomy can be safely performed, if a minimum of handling of the tissues is permitted. The rationale of appendectomy here is not clearly understood and the operation must be done upon empiric grounds. End-results substantiate this surgical procedure as being of considerable value in the successful treatment of this disease. Carbolization without inversion of the appendiceal stump should be the operative technique employed in the majority of cases. The peritoneal cavity should be closed without drainage. The abdominal incision is closed as in a clean case. A small

soft rubber Penrose drain, extending down to the anterior sheath of the rectus muscle, is placed in the lower end of the incision. This is removed 24 hours after operation, to ensure healing by primary intention.

Routine care for appendectomy should be followed, except that the patients are kept in bed until the eighteenth day after operation. A bland, high-vitamin diet, aided by heliotherapy and restricted activity for the next six months, will probably ensure a complete cure. The patient must be impressed with the necessity of always drinking in the future reliable pasteurized milk in order to avoid a possible repetition of this disease. As soon as health is regained the tonsils and other foci of infection in the nose and throat should be thoroughly removed in order to insure permanency of the cure.

Thirty-seven cases (87.5 per cent) occurred during the period between November and April, while the greatest number presented themselves during the month of January. Throat cultures were taken in 39 patients (90.5 per cent) and 37 (97.4 per cent) revealed the presence of *S. hæmolyticus*. In this series of 43 cases of mesenteric lymphadenitis, 5 (11.6 per cent) were proved to be tuberculous, and one appendectomy was done without incidence; 2 cases (4.6 per cent) were incompletely studied and no appendectomies were performed; 36 (83.8 per cent) revealed inflammation only. Of these, 8 (22.2 per cent) manifested acute inflammation, and 3 appendices were removed without mortality, although 2 of the cases presented trying post-operative complications; while in addition, 3 other instances revealed suppuration of mesenteric lymph nodes. Twenty-eight patients (77.7 per cent) had mesenteric lymphadenitis resulting from chronic inflammation, and 24 appendectomies (85.7 per cent) were done without a fatality and with negligible post-operative morbidity.

In this study, cultures were made in 41 of the patients. The microscopic appearance of the lymph node, plus its cultural reactions, justified the diagnosis of tuberculous mesenteric lymphadenitis in 5 instances (12.4 per cent). In the remaining 36 cases (87.5 per cent) 24 gave positive cultures (66.7 per cent). These positive cultures were: *S. hæmolyticus*, 19 (79.2 per cent); *Escherichia coli*, 3 (12.5 per cent);

Escherichia acidi-lactici, 1 (4.1 per cent); and *Eberthella enterica*, 1 (4.1 per cent). A correct pre-operative diagnosis of probable mesenteric lymphadenitis was made in only 8 instances (18.6 per cent). In the remaining 35 (81.4 per cent) it was not considered in the pre-operative differential diagnosis. Microscopic study of sections from the 28 appendices removed revealed only a slight recent chronic inflammation. All of the 43 patients were subjected to an exploratory laparotomy without a resultant fatality.

Thirty-five patients in this series (81.4 per cent) had had either a recent sore-throat or an attack of tonsillitis of varying degrees of severity. The finding of 24 positive cultures in the cultured macerated lymph node, with a predominance of hæmolytic streptococci (79.2 per cent), when compared with the finding of the same organism in 97.4 per cent of the throat cultures is of great importance. This substantiates the work of previous workers in this field and points to the nose and throat as the probable chief etiological focus for the causation of this disease. Infection arising from organisms in either the pharynx or tonsils is conveyed to the ileum by the swallowing of infected saliva, or, more rarely, by the blood stream. Upon reaching the walls of the lumen of the ileum these organisms are removed by the local lymphatic vessels and carried to the regional mesenteric lymph nodes, where the local pathological process begins. In this small series of cases, tuberculosis was not the common etiological agent. *Myobacterium tuberculosis* and *S. hæmolyticus* may also reach the ileum through the ingestion of infected food.

In a recent follow-up study of the 28 operative cases, 26 answered the letter of inquiry as to their present condition; 24 reported themselves as being completely recovered and without complaints referable to their abdomens. One patient, who had had tuberculous lymphadenitis, died of advanced generalized abdominal and pulmonary tuberculosis two years ago. The other patient, who had had acute mesenteric lymphadenitis, still complained after five years' time of vague abdominal discomfort. She was also about 35 pounds under weight. Eighteen of these patients had had either a tonsillectomy or the removal of other foci of infection in the nasopharynx subsequent to their appendectomy.

CONCLUSIONS

1. The pre-operative diagnostic symptoms and signs of mesenteric lymphadenitis have been differentiated, as far as possible, from appendicitis in the adolescent patient.

2. Exploratory laparotomy is the treatment of choice by which a definite diagnosis may be established.

3. Apparently *S. hæmolyticus*, derived from the naso-pharynx, is the common causative organism in this disease.

4. Appendectomy, with a minimum amount of handling of neighbouring tissues and without inversion of the stump, is the treatment of choice in cases of non-tuberculous chronic mesenteric lymphadenitis.

5. Twenty-eight appendectomies were performed in a carefully selected group of patients. All the 43 patients were subjected to at least an exploratory laparotomy. There were no hos-

pital deaths. Follow-up studies reveal that 85.7 per cent are completely well to-day.

6. Post-operative elimination of all foci of infection in the naso-pharynx is necessary to ensure a permanent cure.

REFERENCES

1. BRENNEMAN, J.: Abdominal pain of throat infections in children and appendicitis, *J. Am. M. Ass.*, 1927, 89: 2183.
2. GOLDBERG, S. L. AND NATHANSON, I. T.: Acute mesenteric lymphadenitis: a clinical syndrome in children simulating appendicitis, *Am. J. Surg.*, 1934, 25: 35.
3. LAMSON, O. F.: Mesenteric lymphadenitis and acute appendicitis, *Surg. Clin. N. Am.*, 1931, 2: 1061.
4. MCFADDEN, C. D. F.: Mesenteric lymphadenitis and its clinical manifestations, with special reference to the differential diagnosis from appendicitis, *Brit. M. J.*, 1927, 2: 1174.
5. PRIBRAM, B. O.: Umbilical colic; lymphangitic form of appendicitis and mesenterial lymphangitis, *Abs., J. Am. M. Ass.*, 1935, 105: 473.
6. ROCKEY, E. W.: Thickening of the terminal ileum with mesenteric adenitis in children, *Northwest Med.*, 1933, 32: 145.
7. SREESE, J.: Mesenteric adenitis, *Pennsylvania Med. J.*, 1929, 32: 225.
8. STREUTHERS, J. W.: Mesenteric lymphadenitis simulating appendicitis, *Edinburgh M. J.*, 1921, 27: 22.
9. WILE, S. A. AND SAPHIR, O.: Migratory peritonitis, *Am. J. Dis. Child.*, 1933, 43: 610.
10. WILLENSKY, A. O. AND HAHN, L. J.: Mesenteric lymphadenitis, *Ann. Surg.*, 1926, 83: 612.

THE SIGNIFICANCE OF MENOPAUSAL FLOWING*

By WILLIAM PELTON TEW, M.B., F.R.C.S.(EDIN.), F.R.C.S.(C.), M.C.O.G.,

London, Ont.

UTERINE flowing at the menopause may be divided into two main groups: (a) physiological, (b) pathological. The menopause ordinarily occurs between the ages of forty-five and fifty. It may occur prematurely, when it is usually due to an endocrine disturbance. The distinction between physiological and pathological flowing at or near the time of the menopause often presents a baffling problem for the physician. The patient herself is usually confused, because she looks upon all flowing at this time as an indication of her change of life. The individual patient seldom deems it necessary to consult her physician about matters of this nature until something more formidable than irregular flowing arises. This is one of the chief reasons why many cases of early malignancy of the female genitalia are missed.

One other reason why cases of early malignancy are missed at or near the menopause is that the physician did not carry his investigation quite far enough. An example of this

would be a patient seeking advice for irregular uterine flowing and being told that it is her change of life coming on, without a thorough pelvic examination and a dilatation and curettage being done. She may be given certain advice and medication. This of course does not diagnose or treat early malignancy. It seems therefore that the only remedy at our disposal at present for checking these two obvious leaks in the question of early diagnosis of malignancy is, firstly, to have each patient when approaching or passing through her change of life, report periodically to her physician. I would suggest that she should report at least every three months until she is safely over her menopause. Secondly, I feel that we as physicians should more keenly appreciate our responsibility whenever a patient consults us concerning any abnormal flowing at the time of her menopause. A thorough investigation should include weighing, examination of hæmoglobin, and a pelvic examination. A biopsy of the cervix and a diagnostic curettage should be carried out whenever indicated. I feel reasonably certain that

* A paper read at the annual meeting of the Ontario Medical Association, Fort William, Ont.

such a check-up on womankind at this period of their lives would doubly repay all concerned.

A review of the physiological changes which occur may now be considered. The menopause may come about in any one of the following ways, in so far as vaginal flowing is concerned: (a) an abrupt cessation of the menstrual periods; (b) a gradual decrease in the amount of flow each period; (c) one or more periods missed and then a return to a fairly normal period. Any one of these may or may not be accompanied with certain other changes which are rather characteristic of the menopause. Such may be grouped as follows: (a) metabolic; (b) vaso-motor; (c) nervous. The metabolic changes include a marked tendency towards general obesity. The vaso-motor changes are evidenced by attacks of hot flushing, sensations of tingling and numbness, and at times a sensory neurosis of the throat. The changes in the nervous system may be central or peripheral, as evidenced by phases of mental depression and excitability, also by neuralgic pains and headaches.

The changes occurring in the character of the uterine flowing as outlined above are physiological, and are due chiefly to endocrine changes which are held responsible for the actual bleeding from the uterus. The endocrine glands responsible for such changes are, for the most part, the anterior pituitary body, the ovary, and possibly the thyroid. These physiological changes seldom cause us much anxiety and they rarely cause the patient any particular worry. The accompanying metabolic and vasomotor changes usually cause the patient much more anxiety than the disturbances in the degree or time of flowing. This is unfortunate, because of the decided difference in the actual importance of the two sets of signs and symptoms.

Those manifesting pathological changes constitute a different group of patients. It is this group which cause us the most concern and upon which a watchful eye must be kept until the correct diagnosis is made and proper treatment instituted. Abnormal flowing of pathological origin, occurring at or near the time of the menopause, may be due to any one or any combination of the following causes: (a) endocrine disturbances; (b) inflammatory lesions of the pelvis; (c) new growths; (d) certain systemic diseases.

The endocrine disturbances are chiefly responsible for a group of irregular uterine hæmorrhages which we now term functional uterine hæmorrhages. This term includes the following pathological conditions: (a) metropathia hæmorrhagica; (b) functional menorrhagia; (c) epimenorrhœa; (d) hypomenorrhœa.

Metropathia hæmorrhagica occurs fairly commonly. It is usually found between the ages of forty and forty-five. It may occur in either nulliparous or parous women but is more common in the latter. It usually causes prolonged periods, often lasting a week or ten days beyond the usual time. The uterus is somewhat enlarged, due to muscular hyperplasia and not to the addition of fibrous or elastic tissue. The endometrium is greatly thickened and has a polypoidal appearance. The glands are markedly dilated and tend to form cystic spaces. The epithelium in places is several layers thick. The glandular hypertrophy is predominant in the microscopic picture, and the condition is often termed glandular hyperplasia. The term glandular endometritis has also been applied, but such is not a correct terminology because there is no evidence of an inflammation. For this reason the term glandular endometritis has been dropped. Cystic ovaries are frequently found in cases of metropathia hæmorrhagica. The cysts vary in size from those the size of a pea up to some measuring two and a half inches in diameter. The corpus luteum is almost invariably absent and corpora albicantia are not present. The cysts are follicular cysts lined with a membrana granulosa. The cause is unknown. It may be associated with a disturbance of the anterior pituitary hormone.

The treatment of metropathia hæmorrhagica may prove rather unsatisfactory. Curettage cures about 15 per cent, and several others are somewhat improved. For patients over forty years of age, fifty mg. of radium for thirty to forty hours will arrest the flowing and bring about an artificial menopause. X-ray therapy will accomplish the same result. For younger patients hysterectomy may have to be resorted to. Before doing this, however, one should try out the luteinizing hormone of the anterior pituitary body. Several such products are on the market now. Unfortunately, the dose is empirical, and the hormone is not sufficiently stable to be of very great value.

Functional menorrhagia is a term referring to an excessive loss at the time of the period. This condition is not associated with any definite ovarian disease. It has been claimed that it is due to an absence of the normal clot-producing ferment which is derived from the endometrial stroma. This theory holds that in the normal mechanism of menstruation the blood is acted upon by a thrombokinase which is liberated from the raw surface of the desquamating endometrium. In this way an intra-uterine clot is formed. This clot is then exposed to the action of a thrombolytic ferment excreted in the mucus of the endometrial glands. Liquefaction occurs and fluid blood escapes from the vagina (Whitehouse¹). A deficiency of the thrombokinase is held as the cause of functional menorrhagia. The fundamental cause is however unknown. The endometrium is thin when curetted. This suggests that the condition is due to hormonal influence. Some maintain it is due to an early disappearance of the corpus luteum. Treatment of functional menorrhagia is somewhat similar to that of metropathia hæmorrhagica.

"Epimenorrhœa" means that the menstrual periods are occurring too frequently. The cycle may be reduced to ten or fourteen days in place of twenty-eight days. The loss at this time is usually excessive. It is more common in parous women and occurs usually between the ages of forty and fifty. Pelvic examination for the most part yields a negative result. When curetted the endometrium is œdematous and congested. The glands appear normal. Corpora lutea are found in increased numbers in the ovary. The exact cause is unknown, but again it is believed to be an abnormal stimulation from the anterior pituitary body. The corpora lutea are formed more rapidly than usual, and several may be found which have not reached the stage of corpora albicantia. The treatment of these cases may be rather unsatisfactory at first. An œstrus-inhibiting hormone might be of assistance. In women over forty years of age one may use fifty mg. of radium for thirty or forty hours. X-ray may be used in place of radium. Blood transfusions are given if necessary for the advanced cases. The patient is also given a course of iron whenever indicated.

Hypomenorrhœa is a condition in which the menstrual cycle is prolonged to five or six weeks.

The amount of loss is usually excessive. The pathological findings resemble those of epimenorrhœa. The exact cause is unknown, but it seems to be associated with a disturbed endocrine balance.

The thyroid gland may take some part in these functional uterine hæmorrhages. Some of the patients have a basal metabolic rate increased up to 25 or 30 per cent. Accordingly such patients have had their thyroids treated with x-ray with good results. If the basal metabolic rate is increased above 25 per cent very satisfactory results may be expected from thyroid therapy. Pelvic infection may act as a cause of abnormal uterine flowing. Salpingitis is a fairly frequent cause of epimenorrhœa. Ovaritis always accompanies a salpingitis. Ovaritis may readily cause quite marked disturbances in the normal functions of the ovary. Such inflammatory lesions must be borne in mind when dealing with suspected cases of functional uterine bleeding. Inflammatory disease in the uterus itself is not believed to be as common a cause of functional uterine bleeding as is an accompanying endocrine disturbance.

New growths constitute a common cause of abnormal uterine flowing at or near the time of the menopause. The new growths of the uterus are the most common new growths of the pelvis. These may be divided into (a) benign, (b) malignant. The benign tumours are made up mostly of polypi and fibroids. Polypi of the uterus may be endometrial or fibro-muscular. These may cause a profuse hæmorrhage or just a spotting. The diagnosis is fairly readily made, and the treatment is removal of the polypus. Such a patient should be followed for some time later on account of the tendency of polypi to take on malignant qualities. Fibroids may be present for years without causing symptoms. Abnormal uterine flowing due to fibroids calls for treatment of the fibroids. The treatment decided upon will depend upon the location and size of the fibroid. Myomectomy is the operation of choice whenever possible. Hysterectomy is usually necessary for multiple fibroids. Radium or x-ray therapy is reserved for patients who are not good surgical risks.

Fibrosis uteri is a term applied to the uterus when it contains an excessive amount of fibrous tissue. Fibrous tissue is normally found to re-

place in part some of the muscle as the patient is reaching the menopause. In some patients the amount of fibrous tissue change is abnormal. Here the uterus is firm and larger than normal. The amount of elastic tissue is scant compared with the amount of elastic tissue found in a uterus which is subinvolved. Fibrosis uteri may or may not be accompanied with abnormal uterine flowing. When abnormal flowing is present it is possibly due to some other cause than fibrosis.

The malignant tumours of the uterus are carcinoma and sarcoma. Carcinoma of the cervix most commonly begins near the time of the menopause, and thus the patient is often confused. She looks upon any abnormal vaginal flowing at this time of life as a signal of her change of life. Our only hope for a successful combat against cancer of the cervix is an early diagnosis followed with proper treatment. Again I must mention here the value of periodic pelvic examinations of all women who are passing through their change of life. One of the most constant signs of early carcinoma of the cervix is "spotting" or flowing between periods. Clinically, carcinoma of the cervix is divided into four classes. Group one refers to the early case presenting only a small area on the cervix from which the diagnosis is made. This area is fairly superficial and does not involve the deeper cervical tissues or the glands and cellular tissues at the base of the broad ligaments. Group two refers to the case when the disease has spread deeper into the cervix and may also involve the cellular tissue in the base of the broad ligaments. The uterus in this case may present some degree of fixation, while in group one there is no demonstrable fixation. Group three refers to the case in which the disease has spread still further, involving the cellular tissue of the broad ligaments more extensively. This uterus is considerably more fixed. Group four is one in which the disease has spread throughout the broad ligaments, and involves other pelvic organs. There is marked constitutional evidence of the presence of cancer.

Treatment of cancer of the cervix varies somewhat in detail in different centres, but the main principles are essentially similar. Whether the treatment decided upon is surgical or radium and x-ray, it is imperative that such treatment should be in thoroughly competent hands. Both methods demand a highly trained man at the helm. Either method when poorly carried out will give equally poor results, and either method in good hands may give equally good results. At the outset each case must receive individual attention before the method of treatment is decided upon. Cases falling into group one are usually candidates for radical surgery. If these patients are reasonably good operative risks the Wertheim operation would be the treatment of choice. A few of group two patients may possibly be justly treated surgically. The remainder of group two, along with groups three and four, are candidates for radium x-ray treatment. At the present moment I believe that Healy's² method of using radium and x-ray for cancer of the cervix is giving the most satisfactory results. The details of this need not be gone into here.

Carcinoma of the body of the uterus quite commonly appears at or near the menopause. It does however tend to appear a little later in life than cancer of the cervix. The early signs and symptoms are similar to cancer of the cervix. The diagnosis is made by a diagnostic curettage. Again early diagnosis followed with adequate treatment is our only hope for a successful result. The treatment for the average case is early panhysterectomy. This is commonly preceded with 2400 mg. hours of radium. The prognosis of the early cases is reasonably good.

Hyperpiesis may act as a cause of abnormal uterine bleeding at or near the menopause. Such flowing may act as a safety valve for the patient's elevated blood pressure. Such flowing should always be investigated by the usual diagnostic curettage in order to rule out malignancy.

REFERENCES

1. WHITEHOUSE, B.: Uterine hemorrhage with special reference to malignant disease, *The Lancet*, 1931, 1: 1.
2. HEALY, W. P.: Experience with radium therapy in cancer of the cervix, *Am. J. Obst. & Gyn.*, 1934, 28: 386.

MAKING ETHER AN IDEAL ANÆSTHETIC*

BY W. N. KEMP, M.D.,

Vancouver

GREAT progress has been made within the past decade not only in the discovery of the anæsthetic properties of such gases as ethylene and cyclopropane but also in the improved technique of administration, applicable to all gaseous anæsthetics, which has been evolved by Waters and others. Nevertheless, valuable as these anæsthetics undoubtedly are in expert hands, their range of satisfactory surgical application is definitely more limited than is that of ethyl ether. My purpose in presenting this paper is to call attention to the possibilities for ideal, or almost ideal, anæsthesia by the expert use of that pioneer anæsthetic, ethyl ether, *when the patient has been very thoroughly prepared for operation and anæsthesia.*

What is ideal general anæsthesia? What are the essential attributes of an ideal general anæsthetic agent?

In postulating the essential attributes of an ideal general anæsthetic one must consider the separate viewpoints of three people—the patient, the surgeon, and the anæsthetist. The patient demands safety during the entire anæsthesia and comfort in the induction and recovery stages; the surgeon demands muscular relaxation (in laparotomies) and safety; the anæsthetist prefers an anæsthetic that is simple and flexible in its administration, is of low cost, and is easily transported. It is my considered opinion that ether most nearly measures up to these desiderata. Let me hasten to admit that, under present methods of administration and with present day lack of pre-operative care, ether from the patient's point of view is still far from ideal. However, any discomfort in the induction stage can be readily eliminated by the judicious use of avertin or the barbiturates, while the chief bugbear of ether anæsthesia, post-operative nausea and vomiting, can also be eliminated by what may be termed ultra-conservative pre-operative care. May I briefly review what I consider to be the essential

features of a properly administered ether anæsthesia for a major surgical operation?

The unpleasant and never forgotten psychic reactions that often occur in unpremedicated patients awaiting operation can and should be obviated by rendering the patient stuporose or even unconscious with avertin, one of the barbiturates, or morphia and scopolamine, or a combination of several premedicants. At least one-sixth of a grain of morphia and one hundred and fiftieth grain of atropine should be given at least thirty minutes before the induction of anæsthesia, for the purpose of controlling the secretion of mucus and saliva. In lightly premedicated patients ethyl chloride makes a very satisfactory inducing agent preliminary to a drop ether induction. If the patient is already unconscious the ethyl chloride is usually unnecessary.

When second stage anæsthesia is reached a change is made to vaporized ether, using oxygen as the vehicle to carry the ether vapour to the patient by way of the face mask or the endopharyngeal or endotracheal catheter, according to the dictates of the operation. The plane of the anæsthesia should be kept adjusted to the varying requirements of the surgeon. A cholecystectomy calls for deep third stage anæsthesia, while light third stage is sufficient for intestinal anastomosis (in the absence of marked distension) or other operations not requiring muscular relaxation. The prevention of anoxæmia by the maintenance of a free airway and adequate oxygen supply is essential to the post-operative well-being of the patient, and is at all times the prime essential of a well conducted anæsthesia. The maintenance of a free airway sometimes necessitates the removal by catheter and suction of excessive endotracheal mucus, or in cases of persistent laryngo-spasm calls for endotracheal intubation with a catheter and oxygen administration. We have found in the Vancouver General Hospital that the routine suction removal of endotracheal mucus at the close of

* Read before the Pacific Coast Association of Anæsthetists at San Francisco on November 1, 1935.

the operation is of definite value in decreasing post-operative nausea and vomiting. Dehydration-combating therapy, in the form of subcutaneous or intravenous normal saline solution, is, of course, a *sine qua non* of any major surgical procedure. May I summarize this phase of the subject by saying that the smooth and pleasant induction of narcosis and the careful maintenance of operative anaesthesia with the immediate suction removal after operation of endotracheal mucus are very important steps in the minimizing of post-operative nausea and vomiting. Although attention to the above-mentioned details will accomplish much in minimizing these discomforts, yet there will still, in the majority of cases, be sufficient nausea and vomiting to prevent our anaesthetic being considered ideal. I believe that this can be eliminated *in toto* (or nearly so) by what I have spoken of as ultra-conservative pre-operative care.

ULTRA-CONSERVATIVE PRE-OPERATIVE CARE

In a series of 20 patients in the gynaecological service of the Vancouver General Hospital it has been shown that the daily pre-operative administration of 10 minims of Lugol's solution for five days definitely reduced post-operative nausea and vomiting, as compared to a control series of untreated similar cases in the same service. Similarly, it has been shown in a smaller series of cases in the same service that the pre-operative administration of desiccated suprarenal cortex (Armour) in a dose of six grains, three times daily, for five days before operation, almost entirely eliminated post-operative vomiting in patients narcotized with ether for major surgery.

Undoubtedly, hospitalization previous to operation alone is a potent factor for good in increasing a surgical patient's operative and post-operative well-being. By this stay in the hospital a patient attains a degree of equilibrium which is of real service in decreasing operative and post-operative risks. I will summarize this phase of the subject by stating that as a result of clinical experience I am persuaded that the ingestion of Lugol's solution and suprarenal cortex together with hospitalization before operation are powerful factors in preventing or decreasing post-operative nausea and vomiting and in generally improv-

ing the surgical patient's subsequent well-being.

Dragstedt has shown that the tetany and death that usually follows in untreated thyro-parathyroidectomized dogs can be entirely prevented by simple pre-operative dietetic measures. If the dog be given a meatless diet, with the adequate addition of lactose and calcium, for about one week prior to operation (until such time as his solid excreta are of a light brown colour) he can then be thyro-parathyroidectomized (the thyroid is always removed in animal parathyroidectomy) and he will not develop post-operative tetany *unless meat be added to his diet after operation*. From this work one is surely justified in drawing the conclusion that by pre-operative diet alone dogs can be protected from the severe and often fatal biochemical disturbances that invariably follow thyro-parathyroidectomy. The rationale of Dragstedt's tetany-preventing diet is probably as follows. The meat-free diet, rich in lactose and carbohydrate, causes a radical change in the animal's intestinal flora. The usual predominating toxin-producing *proteolytic* bacteria are superseded (due to the abundance of ingested lactose and carbohydrate and lack of meat) by the innocuous non-toxin-producing *aciduric* bacteria in the intestinal tract. The comparative absence of proteolytic bacteria in the intestine and the absence of meat from the diet cause a minimal production of toxic amines, and hence decrease the liver's burden of detoxication. This decreased hepatic load, together with the assistance afforded by adequate calcium intake (although the dogs will survive untreated thyro-parathyroidectomy with minimal calcium intake), enables the dog to withstand such a radical operation successfully.

The importance of dietary calcium in aiding liver function in detoxication is well illustrated by the experimental work of P. D. Lamson. He has demonstrated that lack of calcium in a dog's diet strikingly diminishes the animal's resistance to a poison such as carbon tetrachloride. It is entirely reasonable to assume that lack of dietary calcium likewise diminishes human resistance to such a poison (although a mild one) as ethyl ether. Post-operative infection of the respiratory tract too often seriously complicates the recovery of the surgi-

cal patient, regardless of what anæsthetic agent has been used. Research has established the fact that the health of the respiratory epithelium is definitely impaired by dietary lack of vitamins A and B. In laboratory animals this avitaminosis and resulting lowered "tone" of the respiratory epithelium results in a decidedly greater incidence of respiratory infections.

DISCUSSION

In view of the fact that the development of aciduric type of intestinal flora acts so effectively in protecting dogs from the serious sequelæ of thyro-parathyroidectomy, it is not improbable that such a bacterial development would be of benefit to human beings about to undergo elective surgery under ether (or any other anæsthetic). In my opinion the terminal effect that the ingestion of meat invariably has on adrenalectomized, hypophysectomized or thyro-parathyroidectomized dogs should bar it in human beings before operation. Inasmuch as calcium is known to assist hepatic function, its presence in liberal quantities, together with vitamin D, should be guaranteed by the pre-operative diet. The well-founded opinion that avitaminosis retards the health and decreases the infection-resisting powers of the respiratory epithelium suggests that the diet before operation be adequate, especially in regard to vitamins A and B. If and when the author's findings are verified, the addition of Lugol's solution and suprarenal cortex to the pre-operative medica-

tion will be indicated. Further, the pre-operative hospitalization of the major surgical patient for at least three days has been definitely shown in Vancouver to pay handsome dividends in the form of a smoother clinical course.

In conclusion I would say that the results of clinical and animal experimentation warrant more serious attention to the diet and medication of the surgical patient before operation. I would suggest that for one week prior to operation the patient should be on a meat-free high carbohydrate diet, abundant in vitamins and calcium, supplemented with 1.5 ounces of lactose daily. For five days prior to operation he should take ten minims of Lugol's solution daily. For three days prior to operation he should be in the hospital, getting into physical and environmental equilibrium.

The fact that the majority of patients survive our present customary lack of preparation is no argument for its continuance. When the patient's well-being, or perhaps even his life, is at stake, it should be the duty of every surgeon and anæsthetist to apply every measure that offers any reasonable degree of assurance of the satisfactory outcome of the proposed operation. Undoubtedly the next great advance in surgery will be in the field of pre-operative care. When this ensues and when anæsthetists are trained to administer ether according to the technique outlined above, or in even better fashion, then we will have made ether an ideal general anæsthetic.

CONSERVATIVE OPERATION FOR "BUNIONS".—E. D. McBride states that the operation that he previously described and termed "a conservative operation for bunions" has fulfilled the surgical requirements and the patient's expectations, as has been shown in an analysis of 39 consecutive cases. The principle of the operation is similar to a step advocated by Silver. The valgus position of the toe is corrected by releasing the adductor tension from the outer side of the base of the proximal phalanx, and the improvement is maintained by shortening the capsule formed by the abductor hallucis. Experience with the procedure brought about the necessity of classifying the cases into types according to the length of time the deformity has existed, the age of the patient, the roentgen appearance of the sesamoid bones, and the severity of the deformity: (1) In patients less than 30 years of age in whom there is a confirmed deformity, thickened painful bursa, no bone atrophy and the sesamoids are not displaced the adductor tendon is detached and transplanted to the outer side of the metatarsal head. The capsule on the outer side of the articulation is freed thoroughly, and if necessary the flexor

brevis is tenotomized to relax completely the proximal phalanx. The external sesamoid is not removed and little or no excision of bone is made from the inner side of the metatarsal head. The bursa is sectioned so that the abductor hallucis is shortened. (2) In patients aged from 30 to 60 in whom there is a fixed deformity, large painful bursa, bone hypertrophy or irregularity and the sesamoids are displaced and misshapen the external sesamoid is removed and as much bone is excised from the inner side of the metatarsal head as is necessary to satisfy the cosmetic demand. (3) In those persons who are past the age of 60 and in whom there is a possibility of circulatory deficiency the procedure is contraindicated. Release of the adductor tension and excision of the hypertrophied bone and bursa may be accomplished when there is no definite evidence of circulatory deficiency. (4) In patients of any age who have arthritis of rheumatic nature surgery should be postponed until acute or subacute inflammatory activity has entirely subsided. The plastic operation is not suitable when the articular surfaces are unsuitable for painless function of the toe. —*J. Am. M. Ass.*, 1935, 105: 1164.

ILEUS ASSOCIATED WITH TRANSIENT RENAL INSUFFICIENCY

BY NORMAN B. GWYN,

Toronto

THIS interesting subject is dealt with by Wakefield, Mayo and Bargaen,¹ of the Mayo Clinic, in a report of several cases which presented the signs and symptoms of ileus without physical conditions in the gastro-intestinal tract which might produce the distension and intestinal paresis. In some of the cases reported the abdominal symptoms were acute enough to induce experienced surgeons to perform a laparotomy, only to find that there was nothing in the abdomen that could be held responsible for the intestinal distension. Careful investigation seemed to indicate that the abdominal condition had arisen as part of a toxæmia due to transient acute renal insufficiency, and it was further evident that as the renal insufficiency subsided the ileus disappeared.

Reading from the carefully prepared report, I realized that it gave an explanation of a troublesome abdominal distension which came under my observation in recent years, and the case hereunder is reported in the hope that it may assist others in the handling of this most serious abdominal complication.

CASE REPORT

Col. M., aged 82, always very strong and well in the past. Five days previous to his admission to the hospital he had had a cataract removed, a local anæsthetic being used. Twenty-four hours after the operation he began to have marked distension of the abdomen with inability to move the bowels. He vomited, was very restless through the night, and forty-eight hours later was found with his abdomen badly blown up, with persistent nausea and regurgitation, and with inability to move the bowels. Seventy-two hours later it was noted that he did not want to eat, that there was occasional vomiting, and that his tongue was dry, but the notes show that there was no absolute obstruction, though very little response to enemas or to the repeated doses of salts which had been given for the two days preceding. Ninety-six hours later it was quite evident that the patient was badly poisoned. The white blood count had risen to 20,000 per c.mm. There was still some vomiting, the abdomen was very tense, and the outline of what looked like the colon could be easily traced through the walls. There was no sign of fluid in the flanks. Some little colicky pain across the mid-abdomen and some little tenderness on pressure were all that could be made out on the most careful examination. There was nothing in the rectum. Some intestinal movements persisted, as they could be readily heard by stethoscope. The bladder did not seem distended; the prostate was slightly enlarged. The urine showed on the first examination—specific gravity 1.030, a very

much reduced amount for the twenty-four hours, no sugar, albumin two plus, and many casts of all sorts.

On the fourth day a temperature of 99° was recorded. Apart from this, however, the temperature remained persistently subnormal. The non-protein nitrogen was found to be 61; blood sugar was in normal range. Treatment by repeated enemas, hot fomentations, and pituitrin injections gave some relief. On this fourth day of the illness the patient passed a comfortable night, and the next day had a good bowel movement. His abdomen softened considerably, though still remaining distended.

In the next two days outspoken symptoms in connection with the genito-urinary tract were in evidence. The abdomen still remained distended, though it became easier to reduce it with enemas and pituitrin, but complete suppression of urine developed and persisted for twenty-four hours, no urine being found in the bladder. By the next day, however, a catheter found six ounces, very distinctly albuminous and containing upwards of 300 granular casts per high-power field. This enormous excretion of casts disappeared immediately, and subsequent examinations showed only a few pus and red blood cells, and in a few days free flow of urine was established.

Following the use of the catheter there was some irritation of the bladder and the patient was unable to void. It became necessary to remove the urine two and three times a day, and the bladder remained parietic for about two weeks. Control then gradually returned and the abdominal distension completely disappeared. With the relief of distension and the clearing-up of symptoms the patient quickly improved and the necessity for any further investigation of the gastro-intestinal tract seemed removed. The urine cleared, the non-protein nitrogen dropped to 40 and 30, and no signs remained of the curious, unexplainable toxæmia which had given rise to an abdominal condition so acute that one consultant had advocated immediate exploration, and a kidney upset which had resulted in a complete suppression of urine, with a cylindruria of unusual proportions.

In a general way the internist is familiar with the syndrome of acute abdominal distension occurring in connection with chronic kidney disorders, and it is fair to say that such cases have often been considered to be due to some form of acute inflammation hidden somewhere in the abdomen. It is distinctly unusual, however, in a medical clinic, to hear such a symptom-complex referred to as a true ileus; and the probability is that most observers have failed to recognize that an acute form of intestinal paresis may develop in the course of an illness more purely medical than surgical. The observation of the Mayo Clinic is for this reason one of real interest and the title "an enterorenal syndrome" is one which might well remain fixed in our

minds. Most important in the consideration of these cases of acute ileus, however, is the suggestion that the symptoms may occur with a transient renal insufficiency and that after the ileus has subsided a clearing-up of the signs of kidney disorder may take place.

Whether the upsetting of the kidney function predisposes to the occurrence of ileus or whether the ileus provokes the signs of renal damage is difficult to say. The majority of cases reported, including that above described, seem to be in subjects well on in life, whose arteries might be expected to show progressive degeneration. The subsequent history of the patient noted above would suggest that some vascular lesion had occurred in the cord, for he required to be catheterized for several weeks after his acute illness.

As to what may be the prime cause of an ileus there is, of course, no universal agreement. In the light of present-day investigation, some upsetting of the metabolism which results in a chemical disturbance around the nerve endings in the intestinal muscles would seem, if we believe the physiologists, to have an important bearing. Whether some similar disturbance in the nerve endings in and about the kidneys might be actively set up at about the same time as the ileus was developing, is, of course, a possibility, but something about which it is at present unwise to be too dogmatic. The observers who described the enterorenal syndrome say:

"To assume that the renal insufficiency was produced by the arteriosclerosis is in keeping with clinical and pathological experience. It is also conceivable to

assume that both the ileus and the transient renal insufficiency were the result of synchronous local vascular disturbances in the kidneys and intestine or were the result of reflex action of the central nervous system. In the cases in which an exploratory laparotomy was performed there was a dilatation in the lower part of the ileum and right half of the colon, but no detectable circulatory disturbance. The absence of circulatory changes in the intestine is not convincing enough to assume that the syndrome was not the result of circulatory changes that were produced by vascular disease. The two exploratory operations were most valuable in the formation of a mental picture of what was going on in the abdomen, and in ruling out gross pathological changes."

The concluding remarks of the observers at the Mayo Clinic indicate that they had gone much further in their investigations of the ten cases with which they were dealing than we had thought necessary to do with our own case. They particularly note that there was in all an elevation of the concentration of urea in the blood, that the value for the chlorides was high, and that the carbon dioxide combining power was normal. These two latter tests, of course, are more particularly in the way of distinguishing obstruction in the upper part of the intestine from distension and obstruction in the lower bowel. They suggest that if a patient presents the signs and symptoms of acute obstruction of the colon with a high blood urea, that a conservative method of treatment is more to be considered, and that the existence of acute ileus with renal insufficiency, or their so-called "enterorenal syndrome", should be kept in mind.

REFERENCE

1. WAKEFIELD, E. G., MAYO, C. W. AND BARGEN, J. A.: Ileus associated with transient renal insufficiency, *J. Am. M. Ass.*, 1935, 104: 2235.

PROTAMINE INSULINATE.—H. C. Hagedorn, B. N. Jensen, N. B. Krarup and I. Wodstrup, Copenhagen, Denmark, treated 85 patients with protamine insulinate. During the patients' stay in the hospital the blood sugar was examined as a matter of routine, five times every day. More than 15,000 blood sugar determinations and 3,000 determinations of sugar and ammonia in the urine form the basis of the present communication. The patients treated have been on a diet with an average of about 2,300 total calories, individually modified according to the calculated standard metabolism (Du Bois) of every patient. The test of the effect of the protamine insulinate has been made by comparing periods in which the patients were treated with ordinary insulin with periods in which, under exactly the same conditions otherwise, they were treated with protamine insulinate. The sharp peak effect, usually seen three or four hours after the injection of ordinary insulin, is largely avoided by the use of protamine insulinate. The effect of protamine insulinate is more prolonged—roughly about twice as long as that of ordinary insulin. Without increasing the number of injections, one can by this means diminish

the blood sugar fluctuations, reduce or suppress the glycosuria, and reduce the ammonia excretion, and at the same time reduce the risk of the occurrence of hypoglycemia. The effect seems to be the same whether the patients stay in bed or not. It has been as effective in children as in grown-up persons. When the treatment with ordinary insulin gives satisfactory results, the use of protamine insulinate is of no special value. Feelings of uneasiness due to acidosis or high blood sugar were relieved without giving more than two injections daily. In the discharged patients, especially the children, it was found to be easier to maintain the regulation by treatment with protamine insulinate. When ordinary insulin is given in the morning after protamine insulinate in the evening, the ordinary insulin will in most cases be much less violent in its effect, because it is given at a moment when the organism is in fairly good balance and the blood sugar fairly low. It is usually best to give the injections at equal intervals, 8 a.m. and 5 p.m. In many cases it is possible to do with a smaller dose of protamine insulinate than of ordinary insulin.—*J. Am. M. Ass.*, 1936, 106: 177.

SOME ENTOZOA OF MAN AS SEEN IN CANADA AND SOUTH AFRICA*

BY H. B. FANTHAM AND ANNIE PORTER,

*Department of Zoology, McGill University,**Montreal*

DURING the past two years of residence in Montreal opportunity has been afforded us of examining microscopically faecal and other materials from a number of persons for animal parasites. Following on our sixteen years of similar examinations in Johannesburg, S.Af., it is of interest to compare the results of the examinations made by us in the two cities, especially as there are considerable differences in altitude, climatic conditions, and composition of the population in the two places.

Johannesburg is situated in the Transvaal, 5,800 to 5,900 feet above sea level, on a high tableland, 26.11° S. latitude and 28.7° E. longitude. It is thus only 3 degrees south of the Tropic of Capricorn. Its air is exhilarating, as it has a so-called "plateau climate", and there is much sunshine even during the winter. The rains in Johannesburg are summer rains and so the winter is dry. The temperature in the summer may reach 90° F. in the shade, while even in the coldest winter weather it is relatively warm at mid-day, and only a few degrees of frost are experienced during a few winter nights. Only a very small amount of snow falls during some winters.

Montreal is on an island in the St. Lawrence, nearly at sea level, 45.31° N. latitude and 73.35° W. longitude. There is a long, cold winter, when -40° F. may occasionally be experienced. The spring is short, the summer hot and humid, when the temperature may reach 90° F., and a short autumn or fall introduces the winter, when 11 to 14 feet of snow may fall in the city.

With regard to the population of the two places, each is cosmopolitan in some respects, though the composition of the population is different. Johannesburg, on the greatest producing gold field of the world, has a cosmopolitan European population, mainly Dutch and English, but

with Portuguese, Italian, French, German, Greek and Scandinavian elements, a rather large population of Jewish people, mostly from Central Europe and Russia, a very large population of natives, members of many Bantu tribes, who are employed as house boys, shop delivery boys, labourers and workers in the gold mines, a small Indian population, chiefly grooms, vegetable growers and sellers, small shopkeepers, and a few silk merchants, and a very small Chinese population, chiefly engaged as vegetable growers, small shopkeepers, laundry workers, and a few silk merchants. The Asiatic population is mainly descended from people imported as indentured labourers for work on mines or railway construction or for work on the Natal sugar plantations, many years ago, and all have been born in South Africa. Many of the native mine workers come under contract from Portuguese East Africa. Both natives and Asiatics have added directly to the health problems of the Union, for they have brought certain parasitic diseases with them.

In Montreal there is the usual white cosmopolitan European element, due to it being a very large port, in addition to the settled population, in which the French Canadian is most numerous and the British next. A distinct Balkanic and Russian Jewish element is also fairly strong. Italian, Greek and Scandinavian peoples are present in small numbers. A prosperous Chinese element has its own district and engages in commerce and laundry work. There is a small African element consisting of negroes originally from the West Indies and the United States, largely West African in ultimate origin, and a sparse representation of North American Indians or hybrids between them and other elements in the population. The Asiatic and African elements in Montreal perhaps also appear to be of some significance in relation to parasitic disease, though more investigations are certainly needed in this direction.

* Read at the afternoon scientific session of the Pan-American Medical Association, Section of Tropical Medicine, on July 21, 1935.

MATERIAL AND METHODS

Fæcal examinations may first be considered and then blood examinations.

In Montreal we have made examinations of fresh stools of hospital patients, many in the Royal Victoria Hospital, some patients of private practitioners, and a few students. In the first instance the investigation was undertaken in an attempt to ascertain the excitant in some cases of colitis,⁴ stools of patients not suffering from gastrointestinal complaints being used as checks or controls and as samples of the general population. In some respects the cases became more of a selective nature, for, *Entamæba histolytica* having been established by us as the causal agent of certain cases of colitis, interest was aroused and resulted in more stools of such colitis cases and of patients suffering from diarrhœic conditions being submitted for examination. A few of these patients came to Montreal from other Quebec cities and from other provinces, but the greater number were residents of Montreal or its vicinity. The few students were apparently normal, healthy young males.

The stool of each person was examined at least once microscopically and once by concentration or enrichment methods. In some cases as many as twenty examinations were made for one patient. Fresh preparations in normal saline, in 0.5 per cent methyl green, and in Gram's iodine were always examined. Occasionally fixed and stained preparations were used. A number of stools were washed for parasitic worms.

In Johannesburg, the examinations made by us at the South African Institute for Medical Research were of stools derived from patients at the large Johannesburg General Hospital, the Non-European Hospital, Children's Hospital, various mine hospitals and private patients of various medical practitioners from all parts of South Africa. The same procedure was used as in stool examinations in Montreal. While many were sent for examination on account of abdominal malaise, others were sent as routine measures only. Thick and thin blood and lymph smears, sent for examination for hæmatozoa, were usually stained with Giemsa's solution or with hæmatoxylin and eosin.

While the results are not entirely comparable, yet there is a parallelism, as will be shown subsequently, and this emphasizes that conditions of

entozoal infestation in a place almost in the tropics, such as Johannesburg, may be duplicated, at any rate to some extent, in a city in a geographically more temperate region, such as Montreal.

In this paper the term "parasite" is used in a general sense and is practically synonymous with "entozoon".

ENTODIA FOUND IN HUMAN STOOLS
IN MONTREAL

During two years in Montreal, the stools of 563 persons, comprising 242 men and 321 women, have been examined for Entozoa, both Protozoa and Helminthes, and of these 208 persons (94 men and 114 women) harboured some species of intestinal Entozoa. While 148 persons had one species of intestinal Entozoa, 50 harboured two kinds of Entozoa, 9 had three species and 1 had an intestinal fauna of four different kinds of animal parasites. These may now be summarized.

SINGLE PROTOZOAL INFECTIONS

Nine kinds of Protozoa have been observed as the sole animal parasite present in the stools of persons examined. These were:—

	Name	No. of persons
Sarcodina	<i>Entamæba histolytica</i>	63
	<i>Entamæba coli</i>	15
	<i>Endolimax nana</i>	8
	<i>Iodamæba butschlii</i>	2
	<i>Dientamæba fragilis</i>	5
	Free-living amœba (<i>Vahlkampfa</i> sp.) ..	1
Mastigophora	<i>Trichomonas hominis</i>	7
	<i>Chilomastix mesnili</i>	26
	<i>Giardia intestinalis</i>	15

SINGLE HELMINTHIC INFECTIONS

Five kinds of single Helminthic infections have been found, thus:—

	Name	No. of persons
Cestoda	<i>Hymenolepis diminuta</i>	1
	<i>Diphyllobothrium latum</i>	1
Nematoda	<i>Trichuris trichiura</i>	2
	<i>Enterobius vermicularis</i>	1
	<i>Necator americanus</i>	1

DOUBLE ENTODIAL INFECTIONS

Seventeen combinations of two animal parasites have been found in stools from 50 patients, 14 of the combinations being of 2 species of Protozoa and 3 of them of Protozoa and Helminthes. These may be tabulated as follows:—

Parasites	No. of persons
<i>Entamæba histolytica</i> + <i>E. coli</i>	5
" " + <i>Endolimax nana</i>	2
" " + <i>Iodamæba butschlii</i> ...	1
" " + <i>Dientamæba fragilis</i> ..	7
" " + <i>Chilomastix mesnili</i> ...	12
" " + <i>Trichomonas hominis</i> ..	1
" " + <i>Giardia intestinalis</i> ...	5
<i>Entamæba coli</i> + <i>Chilomastix mesnili</i> ...	1
" " + <i>Giardia intestinalis</i>	3
<i>Endolimax nana</i> + <i>Trichomonas hominis</i> ..	1
" " + <i>Chilomastix mesnili</i> ...	2
<i>Dientamæba fragilis</i> + <i>Giardia intestinalis</i> ...	1
<i>Chilomastix mesnili</i> + <i>Trichomonas hominis</i> ..	4
" " + <i>Giardia intestinalis</i> ...	1
<i>Endolimax nana</i> + <i>Hymenolepis nana</i>	1
<i>Entamæba coli</i> + <i>Enterobius vermicularis</i>	1
<i>Dientamæba fragilis</i> + <i>Trichuris trichiura</i> ...	2

TRIPLE ENTOZOAL INFECTIONS

Nine cases of infection with 3 species of animal parasite have been observed. Of these, 8 persons each harboured a different combination of three species of Protozoa and the remaining patient harboured mixed Protozoa and Helminthes. The organisms and their combinations were:—

<i>Entamæba histolytica</i> , <i>E. coli</i> , <i>Dientamæba fragilis</i> .
" " " <i>Iodamæba butschlii</i> .
" " <i>Endolimax nana</i> , <i>Chilomastix mesnili</i> .
" " <i>Iodamæba butschlii</i> , <i>Trichomonas hominis</i> .
" " <i>Chilomastix mesnili</i> , <i>Trichomonas hominis</i> .
" " " " <i>Giardia intestinalis</i> .
<i>Entamæba coli</i> , <i>Endolimax nana</i> , <i>Iodamæba butschlii</i> , <i>Trichomonas hominis</i> , <i>Chilomastix mesnili</i> , <i>Giardia intestinalis</i> .
<i>Entamæba histolytica</i> , <i>Giardia intestinalis</i> , <i>Enterobius vermicularis</i> .

QUADRUPLE MIXED INFECTION

One case only of a patient with 4 intestinal Entozoa came under observation, the organisms being *Endolimax nana*, *Diphyllobothrium latum*, *Tænia saginata* and *Ascaris lumbricoides*. The worms were diagnosed from embryophores or ova in the stools and recovered from stools passed after treatment.

From the foregoing, several points of interest accrue. It will be seen that 103 persons (45 men and 58 women) harboured *Entamæba histolytica* out of 563 people examined, that is, an infection of 18.3 per cent. While remembering the partly selective nature of the cases already mentioned, it is evident that amœbiasis is a factor to be borne in mind, even in places far north of the Equator and with severe winters, such as Montreal, particularly if such

places are ports. As four other Sarcodina may be present in the human alimentary tract, it is necessary to use both caution and skill in discriminating between the pathogenic *Entamæba histolytica* and the non-pathogenic *E. coli*, *Endolimax nana*, *Iodamæba butschlii* and *Dientamæba fragilis*. Factors contributory to the occurrence and ultimate control of *E. histolytica* will be discussed later.

In 85 persons, flagellate infections occurred, either singly or with other Entozoa.

Four tapeworms, *Tænia saginata*, *Hymenolepis nana*, *H. diminuta* and *Diphyllobothrium latum*, have been found in man in Montreal.

Four Nematodes, *Necator americanus*, *Enterobius vermicularis*, *Ascaris lumbricoides* and *Trichuris trichiura*, have been observed.

In addition to the foregoing animal parasites observed in stools, mention must be made of two other parasites obtained at operations or at post-mortem examinations and made available to us by the kindness of several colleagues in Montreal during the last two years. The parasites are the human liver fluke, *Clonorchis sinensis*, found twice in Chinese men who died in Montreal, and large, living hydatid cysts of *Echinococcus echinococcus*, from three patients. Several samples of cerebrospinal fluid have also been examined by us for parasites, and in one sample a few hooklets, brood capsules and scolices of *Echinococcus* were present. A very small cyst from human cerebrospinal fluid, sent to us privately by a medical friend, proved to be *Cysticercus cellulosæ*, the larva of *Tænia solium*, but the patient did not belong to Montreal.

ENTOZOA FOUND IN HUMAN STOOLS IN SOUTH AFRICA

In connection with our South African work, reference may be made to figures and differential analyses of parasitological results published in the Annual Report of the South African Institute for Medical Research for 1928, at which time one of us was Honorary Protozoologist and the other Head of the Department of Parasitology in the Institute. Some figures relating to the incidence of animal organisms will also be quoted from other of the Institute Reports, and also remarks made from personal knowledge where certain information was not published in the necessarily condensed Annual

Reports. For instance, in 1931, there is the statement that "*Entamæba coli* was of such frequent occurrence that records were not kept," a statement that is equally true of other years. Unfortunately, records of *Endolimax nana*, *Iodamæba butschlii* and *Dientamæba fragilis* in Johannesburg are also unpublished and are no longer available to us. The Report for 1928 has been chosen as more details are given in it than in many of the other Reports.¹ It must be emphasized that the figures given relate to the number of stools examined and not to the number of persons, as was the case for Montreal.

In the year 1928, the stools examined for animal parasites numbered 5,094, of which 1,739 were suspected of dysentery. The incidence of certain parasites only, as recorded in the Annual Report, is as follows:—

Protozoa	No. of stools
<i>Entamæba histolytica</i>	264
<i>Trichomonas hominis</i>	94
<i>Chilomastix mesnili</i>	106
<i>Giardia intestinalis</i>	118
Cestoda	
<i>Tænia solium</i>	3
<i>Tænia saginata</i>	8
<i>Hymenolepis nana</i>	9
<i>Hymenolepis diminuta</i>	2
Trematoda	
<i>Schistosoma mansoni</i>	26
Nematoda	
<i>Ancylostoma duodenale</i>	315
<i>Necator americanus</i>	12
<i>Ascaris lumbricoides</i>	39
<i>Trichuris trichiura</i>	41
<i>Strongyloides stercoralis</i>	7
<i>Enterobius vermicularis</i>	2
<i>Hepaticola hepatica</i>	1

Considering the pathological significance of *Entamæba histolytica*, out of 1,739 suspected dysenteric stools it was found in 264, or 15 per cent. In 202 it was the only animal parasite present, and in 62 it was associated with from one to four other animal parasites, 25 combinations of parasites having been found. The following analysis gives some idea of the association of *E. histolytica* with various other parasites in fæces.

Entamæba histolytica with one other animal parasite:—

<i>E. histolytica</i> + <i>Chilomastix mesnili</i>	13
" + <i>Trichomonas hominis</i>	7
" + <i>Giardia intestinalis</i>	6
" + <i>Entamæba coli</i>	3
" + <i>Ancylostoma duodenale</i>	2
" + <i>Enterobius vermicularis</i>	1
" + <i>Schistosoma mansoni</i>	3

Entamæba histolytica with two other animal parasites:—

<i>E. histolytica</i> + <i>Chilomastix mesnili</i> and <i>Trichomonas hominis</i>	6
" + <i>Chilomastix mesnili</i> and <i>Giardia intestinalis</i>	2
" + <i>Trichomonas hominis</i> and <i>Giardia intestinalis</i>	2
" + <i>Entamæba coli</i> and <i>Giardia intestinalis</i>	1
" + <i>Entamæba coli</i> and <i>Ancylostoma duodenale</i>	1
" + <i>Entamæba coli</i> and <i>Chilomastix mesnili</i>	1
" + <i>Trichomonas hominis</i> and <i>Spirochæta eurygyrata</i>	1
" + <i>Giardia intestinalis</i> and <i>Tænia solium</i>	1
" + <i>Trichomonas hominis</i> and <i>Ascaris lumbricoides</i>	2
" + <i>Trichomonas hominis</i> and <i>Ancylostoma duodenale</i>	1
" + <i>Ancylostoma duodenale</i> and <i>Ascaris lumbricoides</i>	2
" + <i>Ancylostoma duodenale</i> and <i>Necator americanus</i>	1
" + <i>Ancylostoma duodenale</i> and <i>Schistosoma mansoni</i>	1
" + <i>Schistosoma mansoni</i> and <i>Ascaris lumbricoides</i>	1

Entamæba histolytica with three other animal parasites:—

<i>E. histolytica</i> + <i>Chilomastix mesnili</i> , <i>Giardia intestinalis</i> and <i>Ascaris lumbricoides</i> ..	1
" + <i>Chilomastix mesnili</i> , <i>Schistosoma mansoni</i> and <i>Ancylostoma duodenale</i>	1
" + <i>Entamæba coli</i> , <i>Chilomastix mesnili</i> and <i>Trichomonas hominis</i>	1

Entamæba histolytica with four other animal parasites:—

<i>E. histolytica</i> + <i>Ascaris lumbricoides</i> , <i>Ancylostoma duodenale</i> , <i>Trichuris trichiura</i> and <i>Trichomonas hominis</i>	1
---	---

Another pathogen of much importance occurring in stools is *Schistosoma mansoni*, particularly in certain districts in Portuguese East Africa from which native labour is recruited for the gold mines of the Witwatersrand. In 26 stools ova of *S. mansoni* were found, and in 14 they were associated with other parasites as follows:—

<i>Schistosoma mansoni</i> + <i>Entamæba histolytica</i>	3
" + <i>Trichomonas hominis</i>	1
" + <i>Ancylostoma duodenale</i>	2
" + <i>Ascaris lumbricoides</i>	2
" + <i>S. hæmatobium</i> and <i>Ascaris lumbricoides</i>	1
" + <i>Trichuris trichiura</i> and <i>Ascaris lumbricoides</i> ...	2
" + <i>Trichomonas hominis</i> and <i>Enterobius vermicularis</i> ..	1
" + <i>Ancylostoma duodenale</i> and <i>Enterobius vermicularis</i> ..	1
" + <i>Ancylostoma duodenale</i> and <i>Entamæba histolytica</i> ..	1

The incidence of certain animal parasites in stools for some other years may be of interest.

In 1931, the stools examined were 4,491. *Entamæba histolytica* was detected in 271 of them; *Chilomastix mesnili* in 173; *Giardia intestinalis* in 152; *Trichomonas hominis* in 121; *Tænia saginata* in 18; *Tænia solium* in 1; *Hymenolepis nana* in 2; *Hymenolepis diminuta* in 1; *Schistosoma mansoni* in 9; *Ascaris lumbricoides* in 19; *Enterobius vermicularis* in 1; *Trichuris trichiura* in 24; *Strongyloides stercoralis* in 4; and *Ancylostoma duodenale* and *Necator americanus* together numbered 220.

In 1932, the stools examined numbered 4,684. *Entamæba histolytica* was found in 226, being the sole animal organism present in 174 and occurring with one, two or three other parasites in 52 specimens. *Chilomastix mesnili* occurred as the sole infection in 156 stools, and *Giardia intestinalis* in 122. In this year 418 stools were specially examined for hookworm ova, and these were found in 197 of them, while they also occurred in 10 stools sent in for examination but not under suspicion of hookworm infection. *Ancylostoma duodenale*, *Necator americanus* and *Ternidens deminutus* were represented.

Special attention having been given for several years to the incidence of hookworm on the gold mines of the Witwatersrand, the stools of Europeans and of natives suspected of hookworm as contributory to anæmia and run-down conditions were systematically examined for parasites. The number of hookworm cases among white men was relatively small compared with the large number of unaffected white workers, but such cases were contracted through soil pollution on the mines by careless natives, who disregarded the abundant latrine accommodation provided. The cases among natives were mainly of the carrier type, the mine labourers having brought the hookworms with them from their distant homes.³

HÆMATOZOA IN MONTREAL

With regard to blood-inhabiting parasites, in Montreal there has been little opportunity to examine human blood films, but of the few so far examined, three contained malarial parasites. Two of them had young trophozoites ("rings") and one of the two also rosettes of *Plasmodium vivax*; the other harboured fairly numerous rings and a very few gametocytes ("crescents")

of the malignant or sub-tertian parasite, *Plasmodium falciparum*. As far as could be ascertained, none of the three persons had ever lived in or visited the tropics. One was born on Montreal Island and was stated never to have been farther south than Sherbrooke, Que. No mixed infections of malarial parasites so far have been observed. There are several species of Anopheles around Montreal.

One blood film containing a Spirochæte, either *Spirochæta recurrentis* or a variety thereof, has been shown to us, the patient having perhaps contracted the parasite in the Southern States, where he had visited.

Two series of blood films have been examined for Microfilariae, but in neither case were the parasites observed. One series of lymph slides examined for evidence of filarial infection was also negative.

There has been no opportunity in Montreal for us to examine post-mortem material in the blood vessels of which adult *Schistosoma hæmatobium*, *S. mansoni* or *S. japonicum* may occur. We have obtained ova of *S. hæmatobium* from the urine of one person who had contracted bilharziasis in West Africa and have examined a number of stools from another man who had been treated for bilharzial dysentery when resident in East Africa, the treatment apparently having been successful, as judged by the absence of ova of *S. mansoni*.

HÆMATOZOA IN SOUTH AFRICA

With regard to Hæmatozoa in Johannesburg, every year about 1,500 to 1,600 blood smears were examined by us for malarial parasites. In 1928 at the South African Institute for Medical Research, 1,592 slides were examined, of which 233 contained malarial parasites, 140 being *Plasmodium vivax*, 61 *Plasmodium falciparum*, and 32 a mixed infection of *P. vivax* and *P. falciparum*. In 1932, when 1,619 slides were examined for Hæmatozoa, 291 contained malarial parasites. Of these 48 contained *P. vivax*, 64 *P. falciparum* and 177 both *P. vivax* and *P. falciparum*. Two slides had *P. malariae*, quartan malaria being infrequent in South Africa and occurring at the end of the malarial season. Human trypanosomiasis does not occur in the Union of South Africa. *Spirochæta duttoni*, the causal agent of African tick fever, was found in the blood of three patients from different

places in the Transvaal in 1932. Specimens of blood examined for filariasis in 1932 proved negative. However, the writers have seen a few cases of human infection with *Microfilaria*, to which brief reference will be made later.

The blood flukes, *Schistosoma hæmatobium* and *S. mansoni*, or their ova, were seen fairly often in Johannesburg. Thus, in 1932, 616 samples of urine were examined and ova of *S. hæmatobium* were found in 256 of them. In one of these, ova of *S. mansoni* as well as of *S. hæmatobium* were present. In 1928, the number of urines examined for animal parasites was 496, of which 172 contained ova of *S. hæmatobium* and in 5 of which ova of *S. spindalis* also occurred. In this year ova of *S. mansoni* were found in 26 stools.

Ova of *Schistosoma japonicum* were found in three Indian children in a village near Durban, where Japanese and Chinese sailors had visited from the port.

SOME COMPARATIVE REMARKS

In comparing the results of human stool examinations for animal parasites made in Montreal with those made in Johannesburg, it is clear that there is a distinct similarity between the two intestinal faunas. Even taking into account the partly selective nature of the cases in Montreal, it is evident that certain human maladies due to animal parasites, to which the term "tropical diseases" has been inappropriately applied, can occur in a city where -40° F. can be registered in winter as well as in a city where 70° F. occurs in mid-winter, while in Montreal damp heat prevails in summer and in Johannesburg, relatively dry heat. Montreal is nearly at sea-level; Johannesburg at approximately 5,800 feet above the sea.

The composition of the entozoal faunas may be broadly compared. *Entamæba histolytica* has been found in men and women in Montreal. Of 563 persons whose stools were examined by us, there were more women than men and more women were infected. The percentage of men harbouring *E. histolytica* was 18.6, the corresponding percentage for women being 18.0. As before mentioned, the Montreal cases became of a somewhat selective nature. According to reports from various sources in the United States more men than women have been found to be infected. In Johannesburg in 1928 the stools

found to contain *E. histolytica* were 15 per cent of those suspected to be dysenteric. However, the incidence of *E. histolytica* in all the stools examined in Johannesburg for animal parasites in that year was only 5 per cent, the sex distribution not being given.

Relatively, the number of cases in which *Entamæba coli* was found in Montreal is much smaller than in Johannesburg. *Endolimax nana* and *Iodameba butschlii* are of about the same frequency in both places. *Dientamæba fragilis* has been found relatively more frequently in Montreal than in Johannesburg.

Intestinal flagellates are more or less cosmopolitan. In some cases in each city, Flagellates were the only organisms, bacterial or animal, of possible pathogenic significance present, and with their elimination subsidence of symptoms occurred. So far, the massive infections with *Chilomastix* and *Giardia* encountered so frequently in the Great War, and fairly commonly in South Africa, have not been observed in Montreal, where the numbers of flagellates per stool have been moderate or relatively small. In one case in Montreal, where *Giardia intestinalis* was present in a stool in fairly large numbers, the flagellate was abundant in aspirated bile. In this patient gall bladder trouble had been diagnosed clinically. Under appropriate treatment by the physician concerned, *Giardia* was eliminated and the gall bladder discomfort subsided. Such gall bladder infections with *Giardia* appeared to occur more frequently in Johannesburg—at any rate, there were many more requests for examinations of bile for these parasites.

When helminthic parasites are considered, there is also a resemblance between conditions in Montreal and Johannesburg.

So far as Cestoda are concerned, *Tænia saginata*, *Hymenolepis nana* and *H. diminuta* have been found in human faeces in both cities. In Johannesburg, *Tænia solium* also was found, more particularly among Bantu people, while in Montreal *Diphyllobothrium latum* has been observed. This latter parasite was not seen by us in South Africa, where fresh-water fish are coarse and of few species, and are rarely used for food by Europeans or natives, sea fish being sent inland for European consumption. To many natives, for example, the Zulu, fish are taboo and are never eaten. Pork is favoured

by them and, unfortunately, measly pork (infected with *Cysticercus cellulosæ*) is still a matter of some concern to the health authorities, though it is much less prevalent than formerly. Its use as food cannot be stopped in remote native areas. In Montreal one small cysticercus of *Tænia solium* has been seen in cerebrospinal fluid, as already mentioned, and several such cases were seen in Johannesburg. *Echinococcus echinococcus* has been found in man in both cities. *Cænurus cerebralis* has been seen in man in Johannesburg, but not in Montreal. It may be mentioned that plerocercoids of a fish tapeworm, *Tetrahynchus erinaceus*, occur in marine fish in South Africa. While they do not develop in man, they reduce the nutritional value of the fish as food, though that does not seem to cause much concern to the coloured people of Cape Town who consume such fish as food.

The commonest Trematode parasite observed in man in Johannesburg was *Schistosoma hæmatobium*, the adult flukes being found chiefly in the veins of the bladder, liver and mesentery, while the ova occurred in the urine. Infection is incurred chiefly by bathing in water to which infected urine has gained access and in which the appropriate molluscan intermediate hosts occur. The molluscan hosts of *Schistosoma hæmatobium* in South Africa are *Physopsis africana*, *P. globosa*, *Limnæa natalensis* and *Bulinus tropicus*. One imported case of *S. hæmatobium* has been seen in Montreal. Regarding rectal schistosomiasis due to *S. mansoni*, no case has been found so far in Montreal, though one treated case has been examined. In tropical Africa, rectal schistosomiasis is fairly common. Native labourers on the Witwatersrand gold fields sometimes bring the parasite with them, and cases have been contracted by bathing in polluted pools, ponds and rivers, where the molluscan intermediate hosts of *S. mansoni* occur; such infections have been contracted in small numbers both in the Transvaal and in Natal. The appropriate molluscs there are *Planorbis pfeifferi*, *Physopsis africana* and *Bulinus tropicus*. While no cases of *Schistosoma mansoni* have been seen so far by us in Montreal, it is possible that such might be imported from southern parts of the United States, Porto Rico, Central America, the West Indies or South America. Sporadic cases are liable to be found in any large port. It may be mentioned that in Johannesburg in

1925, at an autopsy on a native, *Fasciola hepatica* was found in his small intestine, and that in the stools of a very few patients in hospital in Johannesburg ova of *Fasciola* were detected.

It has already been mentioned that adult *Clonorchis sinensis* have twice been obtained at post-mortem examinations of Chinese in Montreal. In South Africa, the same fluke was obtained from Chinese people, born in South Africa, who had never been in China, but who had imported fish and tubers and other vegetable food from China for their own consumption. Dried fish from China containing agamodistome cysts, morphologically resembling those of *Clonorchis sinensis*, were also examined by us there. Such imported foodstuffs need careful supervision and examination.

Nematode infections also show likeness in the two cities. Among cosmopolitan Nematodes, *Enterobius vermicularis*, *Ascaris lumbricoides* and *Trichuris trichiura* have been found, more frequently in Johannesburg, as would be expected. Ova of *Necator americanus* have been seen once in Montreal, in the stool of a negro from the West Indies. On the gold mines of the Witwatersrand, *Necator* and *Ancylostoma* both occurred, though the number of worms recovered after treatment was in no way comparable with the enormous numbers of worms passed after treatment in other parts of the world, such as China and the Southern States; this may be ascribed to the provision of ample latrine accommodation underground and extensive use of rock salt in the vicinities most liable to contamination.³ An occasional case of *Ternidens deminutus* was also found, usually in a mine native from Portuguese East Africa. *Strongyloides stercoralis* occurred both in Europeans and natives, but the number of cases seen was relatively few. None has been seen so far in Montreal where far fewer stools have been examined by us.

With regard to filarial infections, *Microfilaria bancrofti* and *Microfilaria perstans* have been observed in very small numbers in blood smears sent to Johannesburg, the preparations having been made from the blood of natives in the copper belt in North West Rhodesia.

The Hæmatozoa, *Plasmodium vivax* and *P. falciparum*, occurred in material examined both in Johannesburg and in Montreal. *Spirochæta*

duttoni was occasionally seen in South Africa, and *S. recurrentis*, or a variety thereof, has been seen in the blood of a patient examined in Montreal.

From the preceding, it is evident that many of the animal parasites found in man in South Africa also occur in Canada, and probably more extended examinations would reveal still others, especially as our personal observations in Canada are limited to two years in Montreal and this paper is confined to our personal experiences. The possibility of the presence of animal parasites, often popularly associated with the tropics or subtropics, needs to be borne in mind in obscure cases of human malaise in more temperate zones. Essentially there is little difference in the kinds of Entozoa that may be encountered in these areas, though the degrees of infestation may differ.

BRIEF REMARKS ON SOME PREVENTIVE MEASURES

It is not our intention in this paper to discuss preventive measures against human Entozoa; only a few remarks will be made thereon.

So far as human intestinal Protozoa are concerned, the consumption of food, especially green vegetables and salads, or of water contaminated with human excrement, appears to be indicated as the main source of infection, and proper sanitation and methods of sewage disposal are essential. Foods eaten raw should be well washed with boiling water and subsequently chilled, if necessary, with cold boiled water. The greatest care should be exercised regarding the purity of the water used in making ice and the subsequent handling of the ice. We have ourselves, unfortunately, seen blocks of ice, taken from delivery carts, dragged along the edge of the road and the pavement on their way to delivery to the customer. It is rather surprising that such is allowed, but we have seen such occurrences in at least two large North American cities. There

must be increased use of household refrigerators.

Carriers of infection certainly are a problem, and special attention needs to be given to all persons engaged in handling or in the preparation of food, drink and ice used in connection with food. Scars, such as occurred after the outbreak of amebiasis in Chicago, accomplish little—the public has a short memory.

There has been progress in the screening of flies from shops where meat or vegetables or fruits are for sale. Such is necessary, as flies can convey protozoal cysts or helminthic ova. Screening of houses against biting insects seems nowadays better understood than formerly. Also, house larders are now often better screened and the use of household refrigerators instead of larders or pantries should be encouraged.

In schistosomiasis areas, natural, fresh-water bathing places should be very carefully chosen and supervised to prevent contamination of the banks and of the water by human dejecta.

Cestode infections indicate the need for careful scrutiny of meat and fish for such parasites, and for great attention to thorough cooking. Meat inspection has, indeed, made great advances in cities, but in small communities there is still need for improvement.

International campaigns against hookworm are too well known to warrant any comment here. The occurrence of such Nematodes as *Ascaris* and *Trichuris* indicates the need for adequate food protection and for proper arrangements for the disposal of night soil.

In conclusion, preventive measures against human Entozoa must not be overlooked in temperate zones any more than in tropical and subtropical regions.

REFERENCES

1. Annual Reports of the South African Institute for Medical Research, Johannesburg.
2. FANTHAM, H. B.: Some parasitic protozoa found in South Africa, I-XV, *S. African J. Sc.*, 1918-1932, 15-29: various pages.
3. PORTER, A.: Some remarks on the hookworm problem in South Africa, *S. African J. Sc.*, 1929, 26: 396.
4. PORTER, A.: Remarks on intestinal parasites in Montreal, and the relation of *Entamoeba histolytica* to colitis, *Canad. M. Ass. J.*, 1934, 30: 134.

VISCERAL BEHAVIOUR IN NEUROSES

BY DOUGLAS GORDON CAMPBELL, M.D.(TOR.), M.R.C.P.(LOND.),

*Assistant Clinical Professor of Psychiatry, University of Chicago,**Chicago*

ONE of the most perplexing problems confronting the modern clinician is the diagnosis, pathology and therapy of those cases to which the term "functional" is applied in order to distinguish them from patients whose disturbed bodily processes can be attributed to material agents. The incidence of "functional" cases, which might better be called "organ" or "somatic" neuroses, is increasing. Many prominent observers estimate them as composing as high as 60 and even 70 per cent of all cases coming to practitioners and general clinics. We know that in some way hazardous times have had much to do with their increase, for business and social insecurity figure prominently in their histories, but we have made little headway with their recognition and treatment. In fact, so far as diagnosis is concerned we lack direct methods and are forced to depend largely upon a process of exclusion.

Organic causes of the patient's distress are eliminated by an exhaustive, and often exhausting, series of tests or surgical operations. The end-result of such a tedious process of elimination is the neurosis, left alone, like the grin of the Cheshire Cat! And even then we are reluctant to forsake our search for material causation. We tell the patient his symptoms are "imaginary", "psychogenic", "hysterical" and we prescribe a change, a rest, a bromide. Then we wonder to ourselves what is really going on in the patient, what "causes" his symptoms. In many of these functional cases the physiological disturbance is obvious—the pulse is too rapid, the bowels erratic, the bladder irritable, or the sexual functions are impaired—various effector mechanisms of the body are disordered.

We know from our training and clinical experience, from biology as a whole, that the organism is continually adapting itself to a changing environment, and that this adaptation is brought about by the effector apparatus of

the body. Any disturbance of adaptation is, we know, due to intrinsic or extrinsic factors; that is, defects in the individual or unfavourable conditions in the environment, or it may be both. But our conventional training in medicine has only taught us to look for the physical or material factors in the individual or his environment, so that, confronted with a problem for differential diagnosis, we think of hereditary, congenital, infectious, inflammatory, degenerative deficiency, traumatic, neoplastic, etc. "causes" of disease. Thus far contemporary medical science takes us. Empirically, however, we are aware of other factors—emotional and social conditions which affect the patient.

An emotional problem in any individual's life is essentially a social problem. Emotions depend upon and are conditioned by our relations with others. When an individual experiences an emotional shock he is involved in a changing relationship with at least one other person; he experiences a change in his social status. Changes of social status occur normally when the developing personality extends its field of social activity from familial to extra-familial relationships, from infancy to childhood, childhood to adolescence, adolescence to maturity with its problems of occupation, friendship, and love, from maturity to decreescence. These changes normally involve the production of emotional tension in the personality. Some of these changes are physiological in character, such as those of adolescence and decreescence, but recent studies have amply shown that the social factors involved at these periods far outweigh the physiological factors in the production of emotional reactions. This emotional shock or reaction may vary in quantity and quality, from the emotional lability of infancy and childhood to the cataclysmic explosions of pent-up emotion consequent upon social upheavals. This is why the incidence of neurotic illness has accelerated since the onset of the economic depression, for

the social status of vast numbers of individuals was violently altered, or at least threatened, resulting in the production of strong emotional tensions. A change in the social status of an individual is a change in his personal worth—his worth in his own eyes or in the eyes of others, in a word, his prestige. Although physical factors may be involved, such as from deprivation consequent upon financial losses, it must be admitted that in most such changes of social status no physical factors whatever are involved. Yet, biologically speaking, a change in the relationship of the individual to his environment has occurred, or may be about to occur. Intangible though it may be, this change of relationship between the individual and his social milieu must be added to our list of "causes" of human disease; it is the "efficient" cause of neurotic illness.

Emotion is experienced by an individual as "affect" or "mood"—a so-called psychic experience; or as "emotional reaction", which is a physiological experience involving various sectors of the effector apparatus. The essence of an "emotional reaction" is a postural change of smooth or striated muscle. In the striated effector system changes of tonus can produce well known signs and symptoms, and in terms of the body as a whole an individual's posture, when it is an emotional reaction, may express elation or depression, the over-tension of strained ambitiousness, or the tremulousness of impending disaster, etc. In the smooth muscle effector apparatus postural variations consequent upon emotion may give rise to the dramatic picture of the gasping asthmatic, the fearful anxiety of cardiac arrhythmia, the agonizing pain of entero-spasm, the embarrassment of dysuria, and the humiliation of sexual incompetence, etc. Thus it is apparent that emotion can express itself just as vividly and certainly more painfully through smooth muscle or visceral behaviour. Realizing this fact, we should look for the emotional tensions in the patient which are consequent upon some actual or impending, real or imaginary, change of social status in his life in order to comprehend the smooth muscle reaction which accounts for the symptoms and signs of his illness.

That emotional expression is a physiological process has been known empirically for a long time. In fact, this knowledge lies at the roots

of our intuitive understanding of human behaviour. Our language is replete with such expressions as "limping through life", "bowed in defeat", "a raging headache", "sick with disgust", "griped with indignation" and "impotent with rage" to mention only a few of the less vivid colloquialisms. Alfred Adler has applied the term "organ jargon" to such physiological processes which are more eloquent than the spoken word, if rightly understood. Inasmuch as this type of visceral behaviour is an effector response of the individual to his notion of his environment, it is a kind of language by which a patient expresses his attitude to some problem of social adjustment confronting him. In this we have a key to the understanding of neurosis, to a complete diagnosis. To reach this diagnosis only two steps are necessary: firstly, what is the situation confronting the patient; and secondly, what attitude do the symptoms and signs, that is the visceral behaviour, express?

The following cases illustrate these principles. Visceral behaviour in these cases is a form of emotional reaction. The emotional reaction is consequent upon actual or impending variation in the social status, that is the prestige, of the patient. Each patient has a characteristic manner or style of meeting such alteration in his social status. There is a situation and a response.

CASE 1

A man of 35 had been under treatment in the University Clinics since the autumn of 1928 for symptoms of bowel distress, exhaustion, sleeplessness and depression, which had commenced insidiously about a year before following a period of heavy drinking. His previous medical history was essentially negative for organic disease, except for an unconfirmed diagnosis of pulmonary tuberculosis which resulted in his obtaining an army pension enabling him to take a college course after his discharge from the army. Thorough clinical and laboratory study in our clinic revealed no organic disease except a mild chronic prostatitis. A diagnosis of "functional colitis" was made, and he remained under observation and treatment for four years, during which time there were only temporary improvements. Having heard or read that the symptoms he complained of were sometimes associated with mental conflict he asked for a consultation with a medical psychologist. The more detailed anamnesis of this clinical approach brought out the following striking, but by no means extraordinary, correlations between this patient's thoughts, feelings and actions in relation to his social adjustment.

His early life history reveals the development of a personality utilizing timidity, caution, ingenuousness, and mendicancy, to ensure its support by others and security from any risk of defeat in competitive relations with others. There were strong feelings of inadequacy, of incompleteness, derived from the fact that he was the baby of the family and surrounded by older and stronger associates when a child, but his sense of inferiority to others was compensated by day-dreams of his possession

of great power and by minor musical, literary and esoteric interests which enabled him to gain some easy recognition among his less accomplished associates, who, by the way, he admitted selecting for just this purpose of exhibiting his superiority. Throughout his life he had evaded positions of responsibility or competition, and it was characteristic of him that he was shell-shocked in his first engagement overseas, and was soon invalided out of the army with what he called "a tuberculosis of convenience for the purpose of getting a college education". As noted above this diagnosis was unconfirmed.

In 1927 when the symptoms of his present illness commenced he had been severely criticized for negligence in his work as an accountant. Immediately after the scolding he had profuse watery bowel movements and abdominal cramps. He had to remain home for some time. He said, "I escaped by becoming physically ill and in this way avoided being fired for inefficiency". Later, with another firm, his accounts were in error and he was arrested for embezzlement, but it was later proved that his careless bookkeeping had been exploited by another employee and he was exonerated. Although at this time under a strict medical regime of diet, rest and medication he preferred to remain in jail pending trial rather than retain his liberty on bond and, while in jail—on the coarsest of food and sharing a cell with tough characters—he lost his colitic symptoms and gained weight! His symptoms returned when he was freed and had to return to work and, in addition, he found he felt worse if he had his meals in restaurants with his friends. He preferred to live on bread and milk in his room, his only companion a piano on which he played his favourite Chopin while he thought of Chopin's great genius marred by ill-health!

He worked no more but returned to his father's home, where his physical condition improved until he was urged to support himself again. Leaving home his symptoms returned. Then he went to a military hospital as a veteran and managed to obtain a 50 per cent disability pension which enabled him to return to college where he studied administrative work. Examinations would bring on exacerbations of his colitis, and his visits to the clinic usually coincided with such episodes of competition and testing. He had been married to a much younger person, but soon became impotent and was discarded openly by his wife for a more adequate lover. Finally, by building up a false courage with alcohol he went through with a divorce and had to pay a small amount of alimony for their one child. Each month when a payment was due he suffered an exacerbation of his colitis, and finally, when unable to keep up the payments because of his own lack of income, he faced prosecution and his colitis became so much worse that he withdrew from the University and again returned to his parents' home.

The association of his symptoms with his mental and emotional states was obvious, but it had been overlooked for two reasons. Firstly, because his physicians were only interested in the mechanical chain of events of an altered physiology; and, secondly, because the routine questions asked about his "nervousness", "worries" and so forth were too perfunctory and provoked the patient's pride so that he evaded giving frank answers. As a case it illustrates beautifully the expression of emotion through visceral behaviour. His gastro-intestinal tract gave a non-verbal, but none the less definite, reply to the demands of his social

environment. It has been the intuitive perception of the meaning of such visceral behaviour which has given rise to the vivid colloquialism, "lack of guts!"

CASE 2

Another case illustrating visceral behaviour as a kind of language or answer to the social demands of life in a situation where, for reasons of pride or social responsibility, the individual will not speak frankly, is that of a young, well-educated and prepossessing woman married to a college professor. She came to the clinic complaining of a rapid, forceful heart action, and received the customary thorough work-up of a large clinic. A diagnosis of functional tachycardia was made, and she was hospitalized for further observation, which proved fruitless so far as detecting any organic lesion was concerned. But an enquiry into her situation in life as a whole, the problems confronting her, and her attitude to them, quickly showed the syndrome to be a neurosis. To the seemingly innocent question, "What would you do if you could be cured of your heart trouble?" she replied without hesitation that she would have a baby! It was a simple matter to trace the onset of her attacks of tachycardia to the time when, returning from European study with her husband to a secure university appointment, he wished to settle down and start a family. She had already postponed pregnancy for the sufficient reason of their uncertain existence as students, but now she had no adequate excuse. She consulted a woman physician, who found a rapid heart and a high systolic blood pressure, and advised postponement of a pregnancy, influenced to some extent no doubt by the history that the patient's father had died at an early age of coronary disease. Settling down to domestic life the patient found that her symptoms were increased by housework, and she had to retire more and more to a life of semi-invalidism and she became a regular visitor to the clinics.

It was convincing enough in this case that effort seemed to produce her tachycardia, but the medical history had overlooked the fact, brought out by a chat about her interests and activities, that certain quite strenuous activities, including dancing and mountain climbing, never disturbed her! And the recent exacerbation timed perfectly with her husband's more urgent insistence on starting a family! When her confidence was won she readily admitted her fear of having a child, a fear based not at all on the physical suffering involved but upon the risk of having her own personal importance lessened. She had been the eldest and for four years the only much petted child in a large family. As other brothers and sisters came along she felt that her importance was diminished, and she cast about for ways in which she might retain the prominence she once had known. She turned toward her father and emulated him, developing as a result quite masculine attitudes and interests. She resented the feminine rôle in life, went in for sports and

intellectual activities, commanded the attention of others by her "masculine" accomplishments and finally married a brilliant man with whom she felt on terms of equality. But equality ended when he acquired a higher academic degree than hers, and, settling down, wanted her to function as a woman—that is as a mother. Then the neurosis, really dormant since early childhood, appeared as a means of arranging a further postponement of the feminine social rôle she hated so much because it involved the danger of having the spotlight shift from her to a baby, just as she had experienced painfully herself in her early childhood. Here, again, it is obvious that the effector mechanism in this woman's adaptation to her social environment was not confined to a striated or wittingly-controlled muscular system. Her response was a visceral one, an organ-language which only required translation to make it as intelligible, as if she had said with words, "I am afraid of doing what is expected of me as a woman, because if I have a baby my own importance will be decreased in the same way as I experienced in childhood."

One more case must suffice to demonstrate this vivid phenomenon of "organ jargon".

CASE 3

A single woman of twenty-six, the director of musical education in a school system, was referred to the University Clinics for diagnosis and treatment by her family physician. She complained of intense upper abdominal pain, nausea, and vomiting, associated with a severe unilateral headache at the time of her menses; duration, between four and five years. Ordinary measures had failed to relieve her, and her physician was forced to use morphine hypodermically during the first two days of her period. Apart from this monthly disturbance she was in excellent health, except for severe headaches when under great pressure of work or responsibility. The most detailed physical and laboratory examinations revealed no organic disease. It had been hoped that the gynaecologist might intervene in some way, but there was not even evidence of endocrine disturbance. When it was suggested to her that she should marry she said that it was impossible as she had to support her mother and an older brother, and did not wish to give up her career which had been a brilliant one. She was angered when referred to the medical psychologist, and proved quite intractable at first, but by degrees the incomplete outlines of the medical history were filled out with more personal data until it was evident to both psychiatrist and patient that her violent physical symptoms were connected with strong emotions arising from certain unsolved social problems.

Born on a farm, she had a brother eighteen months older and a sister several years younger. She was her father's favourite child, as her brother was her mother's. But, when three or four years of age, her father died and she found herself in an unfavourable position in the family circle, jealous of her brother and baby sister. In every way she struggled to race ahead of her brother

—catching up to him in school, doing a boy's work on the farm, out-climbing, out-distancing him, and, whereas he was an amiable obedient child, she was seclusive, stubborn, even rebellious, especially when directed by her mother. Puberty and adolescence brought many temperamental difficulties for she resented having to behave as a woman after being so "tomboyish". Moreover, her brother was favoured in education, and her career was considered of secondary importance. She turned to music as a means of obtaining the solace of seclusion, as a vent for her strong emotions, and as a special field wherein there was no unfavourable comparison with others. She developed so well in musical ability that she was granted scholarships, so that in spite of her mother she was enabled to go to college. She graduated in liberal arts and in music in less time than either course required alone, and again caught up to her brother who had entered the teaching profession. As she had largely to work her way through college, her social life was neglected, but as graduation day drew near and other girls had men friends and in many cases were engaged to be married, she too sought a man in her habitual competitive and intense style. Probably she overplayed her hand. At any rate, the young man broke the engagement. This was a great blow to her pride and she turned back to her music with more devotion than ever before, resolved never to marry.

It was at this time that her neurosis commenced. Entering the public school music field, she rapidly advanced to her position as director of all the music in a school system, and her pupils won many contests against other school systems in the state. She would produce only the best and sometimes the most difficult compositions, worked overtime, and in addition to her school work was organist and "choir master" in the leading church of her town. Before an important performance in school or church it was common for her to develop such a severe unilateral headache that she was afraid she could not appear, and, miraculously, following the performance, at which she would invariably appear, the headache would pass off. But she would take care to let people know that she had a headache or had been ill a day or two so that they would not expect too much of her, or would understand if the performance was imperfect in any way; and after the performance she would say that she could have done better had she not been so ill! When not engaged in teaching or church work she spent her spare time writing an opera which was to be her "magnum opus"—words, music, stage design, and direction by herself. Interestingly enough, the content of this opera was a complete cosmology expressed in religious and puritanical terms. With such activities there was little time for social life or the problem of love, and when this observation was made to her she said that that precisely was her aim—to be so busy that she could not think about men or marriage. Yet once a month she was forced to think about it, forced to remember her humiliating failure in her last year of college, and at such times her stomach spoke more frankly than she had done even to herself or with words to any other person. She had endeavoured during the past four or five years to eliminate from her life the possibility of another defeat from a man, and had redoubled the energy of her original drive to reign supreme in the limited field of music as if her success could be greater if she narrowed her sphere of action. The memory of past failures in other fields stimulated her toward greater efforts in her specialty. The end-result of psychotherapy in this case was a cure and later on the patient married.

Mainly of interest for the purposes of this paper are the sources and mechanism of her symptoms. Here was a "functional" illness clearly enough, and the symptoms were the

result, mechanistically speaking, of the disordered activity of the smooth muscle of blood vessels and gut, due in turn to pathological activity of her "autonomic" nervous system. But are not our emotional reactions expressed by means of the vegetative nervous system through cortico-thalamic connections, and are not our emotions engendered by our problems of social adaptation? Clearly, this woman gave a non-verbal, unrationalized, but none the less understandable reply to the social problem of love which might be translated in some such fashion as, "It makes me sick to be in the inferior position of a woman; remembering my past humiliations I must avoid any possibility of a future defeat."

The three histories presented are by no means out of the ordinary run of clinic cases. They illustrate the type of patient who wanders from clinic to clinic, from doctor to doctor, and eventually find temporary or apparently permanent relief from the charlatans. "Diagnosis", said Galen, "is the understanding of all things present", in a patient. No special understanding or training was necessary to make a diagnosis in these cases; nor is it necessary in most cases. In such cases a more detailed anamnesis than is usually taken in the medical clinic is necessary. Most important of all for diagnosis is the search for the social situation in which the patient's symptoms commenced and reappeared, and the attitude toward the problems of social life which the patient has displayed throughout his existence.

This attitude toward all problems of life, variously called by psychologists "personality pattern" or "style of life" is best seen in the reactions of the patient as a child. A more detailed investigation of childhood and development reveals not only the "life style" of an individual, which is probably determined by the fourth or fifth year of life, but any inherited or acquired organ weaknesses. Later in that individual's life, when we find him under the strain of some social problem for the correct solution of which he has not been properly prepared, we find the consequent emotional tensions expressing themselves by the dysfunction of his organs. It is significant that the affected organs

usually show signs of imperfect development, or for some reason in his development have come to be over-valued by the patient's psyche. These organs, the effector structure of which is either smooth or striated muscle, become as it were the patient's voice-box—they express his attitude toward life and toward the particular problem with which he is confronted. The weakest link bears the strain.

The individual reacts as a unity to the unity of his environment. It is artificial and schematic to split the individual into departments of body and mind, or the environment into physical and socio-psychological parts, except for temporary purposes of analysis. The whole is not a sum of its parts; it is something more; a new function has appeared, a function characteristic of unity. It is a matter of the organism-as-a-whole responding to the environment-as-a-whole. With this point of view and mode of thinking the "functional" case can be approached in a positive manner, a more direct diagnosis can be made, and a rational therapy which is inclusive rather than exclusive follows. Treatment, therefore, should consist not only in the medical or surgical alteration of some organ function, but should include the re-education of a patient toward a way of living which will enable him to solve the problems of social existence without the production of destructive emotional tensions.

SUMMARY

1. Functional or neurotic illness is increasing in incidence, a fact which is directly or indirectly connected with social problems.
2. Functional symptoms are a form of visceral behaviour, capable of physiological analysis, associated with emotional tension which is capable of psychological analysis.
3. Emotional tensions in an individual are connected with problems of social adjustment.
4. Visceral behaviour may thus be an expression of a patient's response to a social situation.
5. Three cases illustrating such mechanisms are presented in a biographical manner.
6. It is concluded that the diagnosis and treatment of so-called functional conditions depends upon an evaluation of emotional or social factors in the patient's make-up and environment.

Case Reports

A CASE OF BILATERAL PARALYSIS OF THE LARYNGEAL ABDUCTORS OF INFLUENZAL ORIGIN

By J. N. ROY, M.D., F.A.C.S.,

Professor at the University of Montreal,

Montreal

When a patient, giving a history of syphilis thirteen years ago, presents a bilateral paralysis of the posterior crico-arytenoid muscles, it is logical to think of a bulbar lesion. Before committing ourselves to a diagnosis, we must however exclude any other cause of the paralysis. Last fall, in my service at the Notre-Dame Hospital, I saw such a case, which later on required a tracheotomy to prevent suffocation. Both laboratory and neurological findings definitely eliminated syphilis. The history of the patient is as follows.

G.A., male, aged 43 years, came to the dispensary of the hospital, November 16, 1934, on account of difficulty in breathing.

On examination we found a bilateral paralysis of the vocal cords which were in a paramedian position. There was no atrophy, but during the effort of inspiration the cords were drawn downwards towards the trachea. On phonation they came slightly together. The glottis was narrowed, and the patient breathed with difficulty. There was hyperæmia of the mucous membrane of the larynx, without ulceration or oedema. Sensibility was normal. The voice was hoarse. There was no lesion of the epiglottis or hypopharynx. Sensation and movements of the soft palate were normal. There was traumatic deviation of the nasal septum to the right, with a slight external twisting of the nose to the left. The cervical and sub-maxillary glands, as well as the thyroid gland were not hypertrophied. There was chronic cryptic tonsillitis.

The patient denied any previous throat trouble. At the age of thirteen years he had had typhoid fever, and about the same time, pneumonia. He had had syphilis at the age of thirty, for which he had been treated very energetically at that time.

On September 18, 1934, he had a very severe attack of influenza, and fifteen days later he noticed a slight hoarseness, accompanied with some difficulty in breathing. Almost one month later, on October 12th, he suffered from recurrence of the influenza which caused an increase of the laryngeal trouble. From this time on respiration became more and more laboured, and one month later the patient entered hospital.

X-ray examination of the chest excluded any enlargement of the tracheo-bronchial glands, mediastinal tumours, or dilatation of the blood vessels. In order to prevent asphyxia, tracheotomy was performed the same day by my assistant, Dr. J. Brault.

Post-operative sequelæ were normal, and two weeks later further examination was continued. There was no Argyll-Robertson pupil, and accommodation was normal:

no lesion of the eyes, and vision was excellent. The Wassermann reaction of the blood and of the cerebrospinal fluid was *negative*. The patient had never suffered from diphtheria, lead-poisoning, malaria, disseminated sclerosis, or tuberculosis. He smoked moderately, and did not use any alcohol. There was no history of any injury to the neck.

A careful and minute neurological examination, by Dr. Jean Saucier, showed a normal condition of the brain and spinal cord. There was no appreciable disturbance of sensation, a fact which eliminated syringomyelia. All the reflexes were normal. Strychnine was prescribed.

The posticus paralysis persisted without any change for one month after tracheotomy. Then, at the end of the fifth week, a slight abduction of the left vocal cord was noticed. Abduction of the right cord appeared some time later. Adduction was normal. Improvement continued gradually, and at the end of December we began to block off the tracheotomy cannula, from time to time, in order to allow breathing through the larynx. On January 21, 1935, the tracheal wound was closed by means of deep sutures, and healing was obtained by first intention.

Desirous of completing the therapy by physical agents, Dr. Laquerrière was asked to take charge of the patient. Infra-red rays of thirty minutes' duration, directed over the anterior part of the neck, were then administered. This combined treatment had a very good effect, for the paralysis diminished; breathing was excellent, and the voice became clearer. At the end of April the left vocal cord so far recovered that the intermediary position was maintained, whilst abduction of the right cord, though still limited, was now more apparent.

As the prognosis of paralysis of the laryngeal dilators due to infective neuritis of the recurrent laryngeal nerves or any other cause is rather unfavourable, it would be interesting to follow this patient's further course, in order to see if complete recovery would occur.

Let us consider the etiological factors that could possibly produce a paralysis similar to the one from which our patient suffered. First, and as always in such cases, comes syphilis. However, the specific infection dated back thirteen years, and at that time, he had been treated in a very thorough manner. At the onset of the paralysis of the posterior crico-arytenoid muscles, both the Wassermann and the cerebrospinal reactions were negative. A most minute neurological examination showed the complete absence of any stigmata of neurosyphilis. And nine weeks after the tracheotomy, without any specific treatment, which had not been judged necessary, the cannula was removed. Since then, with the use of strychnine and physical agents, the improvement continued. It is also probable that had syphilis been the

cause of the paralysis this patient would still be wearing the tracheotomy tube, and perhaps would require it for many years to come. In spite of the great admiration that I have for my late teacher Lermoyez, and many of his school, I am still of the opinion that abductor paralysis of the larynx is not always due to syphilis.

It is needless to consider the syndrome of the posterior jugular foramen, or the more complex syndrome of the associated laryngeal paralysis, for the movements of the soft palate, tongue, shoulder and sternocleidomastoid muscles were normal. We can eliminate toxic neuritis, because the patient lived an out-door life, took neither alcohol nor drugs, and smoked only moderately. Arthritis of the crico-arytenoid joints was excluded for the reason that on my first examination there was no manifestation of an acute laryngitis, and one could hardly imagine such a condition developing in a chronic manner.

As a last resort, we have then to consider infective neuritis of the recurrent nerves. If we review the history of this case, we see that before the 18th of September, the health of the patient was excellent. However, on this date, he was seized with a severe attack of influenza, and two weeks later, a slight difficulty in breathing began to appear. On the 12th of October, a recurrence of the influenza so aggravated the laryngeal trouble that a tracheotomy had to be performed on the 16th of November. On the 21st of January, the tracheotomy tube was removed. Since then, respiration had been good. After excluding all other possible causes of this condition, one is driven to conclude that this paralysis of the abductors of the glottis resulted from an infective neuritis of the recurrent laryngeal nerves of influenzal origin. Further, we know that cases of infective neuritis of the recurrent nerves are met with from time to time, an example of which I published in 1929. This was a case of a young man with a negative Wassermann test, who suffered from a paralysis of the posterior crico-arytenoid muscles secondary to typhoid fever. At the beginning of July, bilateral abduction was slightly more pronounced, and adduction was normal. The voice had been clear for two months previously, and breathing was perfectly free, even during moderate exertion.

To sum up, I would say that the paralysis of the laryngeal abductors in my patient was due

to an infective neuritis of the laryngeal nerves, following an attack of influenza. In conclusion, may I say that after an extensive review of the bibliography this case seems to be the first of its kind reported in medical literature.

BIBLIOGRAPHY

1. LERMOYEZ, M.: Sur les causes des paralysies récurrentielles. Rapport, Congrès Française d'oto-rhino-laryngologie, *Bulletins et Mémoires de la Société*, 1897.
2. SIMONIN, M.: De l'hémiplégie palato-laryngée. Essai de pronostic, Thèse de Paris, 1909.
3. ROY, J. N.: Serous meningitis, choked disc, and polyneuritis of certain cranial nerves in a young alcoholic smoker, *J. Laryngol., Rhinol. & Otol.*, 1912, 27: 465.
4. BALDENWECK, L.: Les paralysies laryngées, *Le Mende Médical*, 1912.
5. VERNET, M.: Sur le syndrome total des quatre derniers nerfs crâniens, *Bull. d. l. Soc. Méd. d. Hôp. de Paris*, 1916, 40: 210.
6. VERNET, M.: Les paralysies laryngées associées, Legendre et Cie, éditeurs, Lyon, 1916.
7. VERNET, M.: Sur le syndrome du trou déchiré postérieur, *Paris Méd.*, 1917, 19: 78.
8. BROECKAERT, J.: Troubles de la motricité, *Traité pratique d'oto-rhino-laryngologie*, Gaston Doin, Paris, 1921.
9. MOULONGUET, A.: Les paralysies laryngées; classification et pathogénie, *Bruxelles Médical*, May, 1924.
10. ROY, J. N.: Typhoid neuritis of the recurrent nerves with consequent paralysis of the laryngeal dilators, *Arch. Otolaryngol.*, 1929, 10: 513.
11. LEMAITRE, F.: Paralysies récurrentielles et pathologie du corps thyroïde, *Ann. d'Oto-Laryngol.*, 1934, 4: 354.
12. HALPHEN, E.: Loi de Semon-Rosenbach, *Ann. d'Oto-Laryngol.*, 1934, 4: 361.
13. RAMADIER, J.: La paralysie des dilatateurs de la glotte, *Ann. d'Oto-Laryngol.*, 1934, 4: 367.
14. REBATTU, M.: Les lésions anatomiques dans la paralysie des dilatateurs, *Ann. d'Oto-Laryngol.*, 1934, 4: 381.
15. MADURO, R.: Causes et symptômes de la paralysie récurrentielle pure, *Ann. d'Oto-Laryngol.*, 1934, 4: 381.
16. BÉRAUD, F.: Paralysies laryngées associées, *Ann. d'Oto-Laryngol.*, 1934, 4: 386.

TRANSMISSION OF MALARIA BY BLOOD TRANSFUSION*

By FRED T. CADHAM, M.D.,

Winnipeg

In 1919 Gubb¹ reported a case of the accidental transference of the malarial parasite from a recipient to a donor in the course of blood transfusion. Subsequently, several reports have appeared describing the accidental transference of malaria from the donor to the recipient during transfusion. Stein² describes a case in which two acute attacks of malaria developed following two separate transfusions from the same donor. Transmission of malaria from a donor who had never known a malarial infection was reported by Oehlecher.³ Decourt⁴ describes transmission from a donor who believed himself to be free of malaria for nine years, and Jankelson⁵ relates the development of malaria in a child given a transfusion from its father who had contracted malaria some forty years previously.

Malaria is uncommon in Canada and extremely rare in the Prairie Provinces. Although the

* From the Department of Bacteriology and Immunology, University of Manitoba Medical School.

anopheles mosquito on a few occasions has been noted in Manitoba no report exists of a case of the disease arising within the province. Mosquitoes do not prevail in Manitoba in the winter. The case about to be described occurred in January and for a time the nature of the condition from which the patient suffered was not suspected.

CASE REPORT

E.D., a girl, aged 13 years, was admitted to hospital in November, 1934, under the care of Dr. Andrew McKinnon. The complaint was deformity of the spine, said to have been caused by a severe fall which occurred some three years previously, but which probably was the result of an attack of poliomyelitis. At that time the injury had been treated by the application of

was suspected, but the Mantoux test and skiagrams of the chest were negative. Blood cultures were negative. A progressive anæmia developed, the hæmoglobin fell to 52 per cent and the erythrocytes to 3,200,000. At the time of these examinations of the blood the malaria parasite was not found.

The symptoms continued for five weeks, when finally malaria was suspected. Blood smears were made and malarial plasmodia in all stages of the asexual cycle were demonstrated. Quinine was administered and the patient rapidly recovered.

The history revealed that five years previously the family had immigrated to this country from Czecho-Slovakia. The father who had acted as the donor for the transfusion had been a circus performer and had travelled extensively in

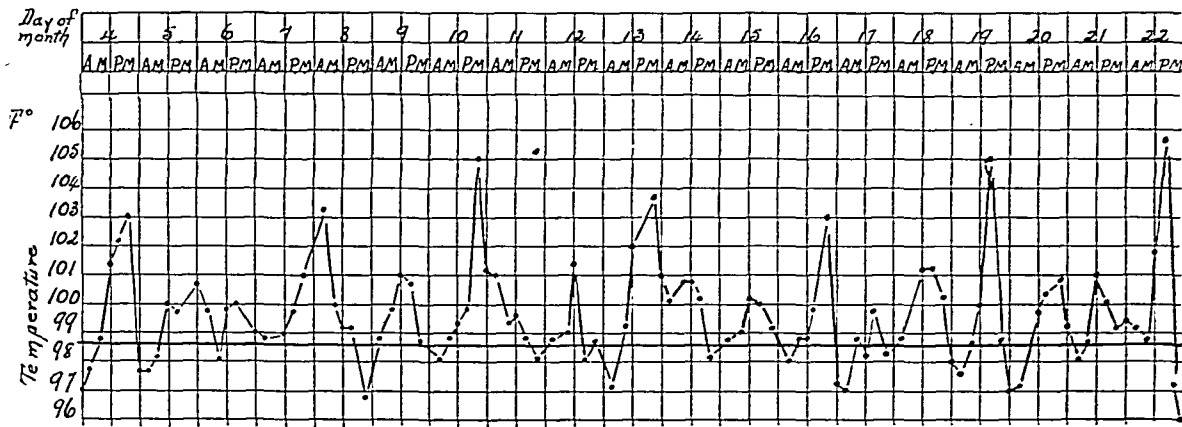


Chart.—The temperature curve seven weeks after transfusion, indicative of quartan malaria. Temperatures were taken for each day at the hours of 4, 8, and 12 a.m. and p.m.

a plaster jacket. Aside from the deformity of the spine the patient appeared to be in normal health. The previous history and physical findings disclosed no evidence of any other pathological condition.

On December 10th, following some correction of the deformity with turnbuckle jackets, multiple bone grafts from the left tibia were placed in a prepared bed from the 2nd to 7th dorsal vertebræ. Immediately after the operation an emergency transfusion was considered necessary. The father acted as donor; 500 c.c. of blood were given.

Three weeks later the patient developed an intermittent fever associated with chills and sweats. A careful examination failed to disclose the reason for these symptoms. The wound appeared healthy, and fusion of the graft to the spine was progressing normally. Tuberculosis

Greece, Egypt and Italy and other countries where malaria is endemic. He also stated that he had been quarantined with patients suffering from malaria, but he himself did not remember suffering from an attack. Examination of his blood disclosed the presence of the *Plasmodium malariae*.

COMMENT

Today blood transfusion is frequently, one might say, extensively, employed as a therapeutic measure. Moreover, for the prevention and in the treatment of certain diseases such as measles and poliomyelitis human blood or blood serum is frequently transfused or inoculated. Accidental transmission of disease during these procedures may occur. Several reports have been published describing the transfer of syphilis through transfusion; as a rule this latter hazard

is controlled, in part, by a preliminary Wassermann reaction.

On occasion, as in the case here reported, the necessity for transfusion is urgent. Under these circumstances sufficient time may not be available to examine the donor and also to obtain a history in the endeavour to eliminate the possible hazard of the transference of disease.

REFERENCES

1. GUNN, A. S.: Accidental transference of the malarial parasite in the course of transfusion, *Brit. M. J.*, 1919, 2: 74.
2. STEIN, H. B.: Transmission of malaria by transfusion, *Am. J. Dis. Child.*, 1932, 44: 1048.
3. OEHLECHER, F.: Uebertragung latenter Malaria bei direkter Bluttransfusion, *Deutsche med. Wchnschr.*, 1920, 46: 1025.
4. DECOURT, P.: Recidive de paludisme à neuf ans de distance; transfusion du sang; transmission du paludisme au donneur, *Rev. de med. et d'hyg. trop.*, 1931, 23: 32.
5. JANKELSON, I. R.: Transmission of malaria through injection of whole blood, *J. Am. M. Ass.*, 1931, 97: 177.

ICHTHYOSIS

By L. M. MULLEN, M.D.,

Cardston, Alta.

Ichthyosis is stated to be a hereditary congenital disease. Although congenital, it does not often manifest itself before the first or second year of life. If present in fetal life to a severe degree the child is usually stillborn or dies a few days after birth.^{1, 2}

The disease is due to a developmental and nutritional defect of the skin. Histological examination in advanced cases shows the vessels dilated, the cutis thickened, and the connective tissue condensed into bands; the hair follicles are lengthened and contain lanugo; the glands are dilated and assume a cystic form; the subcutaneous fat is diminished. One case has been reported in which both sweat and sebaceous glands were absent.² The disease tends to be worse in winter than in summer. The prognosis as to cure is unfavourable.

A case interesting in itself and in respect to its family history, notably the siblings, has been under my care recently.

Baby S.K., male, born on June 28, 1935. Weight five pounds. Delivery by version and extraction because of lateral placenta prævia.

As soon as the baby had been bathed it was apparent that the skin was distinctly abnormal. The best description is to compare it to cellophane. The second day after birth the skin became drier, and cracks were evident, leaving raw fissures. By the fourth day large dry flakes of skin were coming off, leaving similar

dry skin underneath, which a few days later would come off in turn. This continued throughout the life of the child.

The baby nursed fairly well from the beginning, but despite this did not show the usual growth or development. At six weeks his weight was five pounds, one ounce; at eleven weeks six pounds. The bowels and kidneys functioned normally. The baby was quieter than average, sleeping much and crying little. Death occurred with no forewarning symptoms on September 26, 1935.

The treatment consisted of daily oiling, after bathing, with sterile olive oil. Cod liver oil was given internally from the beginning. Raw surfaces or fissures were practically absent after the first month and no infection developed.

The pathological report on a piece of skin taken after death was: "Section of skin. There is a very thick layer of keratinized material on the surface but no other marked abnormality. Hyperkeratosis-skin."

Family history.—Mother and father apparently normal; their Wassermann tests were negative. One sister of the father is said to have a "delicate skin".

The first child of this union was a male born in December, 1928, and was apparently normal. This child was found dead in bed one morning at the age of six months.

The second child (a female) is now five years old and normal. The third child (a male), born in June, 1932, had a large congenital umbilical hernia and a skin condition the same as that of the last baby. Death occurred in one month. The fourth child (a female) is now almost two and is normal. The fifth child is that described in detail above.

Out of 5 children 2 females are alive and normal; 3 males are dead, and 2 of these showed severe ichthyosis. One also had another developmental anomaly in the form of a congenital hernia.

In the literature are reported cases of ichthyosis related to idiocy in seven families.³ I do not find it mentioned in relation to other congenital anomalies, nor do I find any mention of a predilection for the male sex as it appears to have had in this instance.

REFERENCES

1. FOX, G. H.: Photographic Atlas of the Diseases of the Skin, Lippincott, London, Physician's ed., 1905, 2: 3.
2. SAJOUS, C. E. DE M.: Analytic Cyclopaedia of Practical Medicine, Davis, Philadelphia, 9th ed., 1923, p. 642.
3. *Ibid.*, p. 643.

Clinical and Laboratory Notes

THE BITTERLING TEST FOR PREGNANCY*

By R. GOTTLIEB, M.Sc., M.D.,

Montreal

The use of the female bitterling as a test for pregnancy has recently aroused a good deal of attention. This fish possesses an ovipositor which is supposed to elongate when the animal is exposed to pregnancy urine. Kanter, Bauer, and Klowans¹ were the first to report excellent results. Their work was based on the experiments of Tozawa,² Fleischman and Kann,³ and Szusz.⁴ Kleiner, Weisman, and Borowsky⁵ repeated their work, but found it impossible to standardize the fish and concluded that the biological reaction obtained was not a specific test for pregnancy.

The advantage of a pregnancy test with the female bitterling is so great that we felt tempted to repeat the experiments of the above authors. According to Kanter, Bauer and Klowans, standardization of the bitterling is one of the most important pre-requisites. Our attempts to standardize the fish were only partially successful. Fourteen out of 17 fish responded to known pregnancy urine, while 3 did not respond to any kind of urine and were therefore excluded from the test. However, it was impossible to find any of the fish which would not respond to certain urines from non-pregnant women; that is, urine from non-pregnant women or from males which gave a positive reaction in one fish would regularly give a positive reaction in all other fish. *Standardization as required by Kanter, Bauer and Klowans was found to be only partially possible.*

TECHNIQUE

A mature "standardized" fish is placed in a quart of water at temperature of 75° F. The fish is first observed as to whether the oviduct is not beyond normal limits, which is normally about 2 mm. Four c.c. of the urine to be tested are added and the fish observed at 24 hour intervals for 72 hours. In a positive reaction the ovipositor reaches a length of from 15 to 25 mm. Most of the positive reactions occur within the first 24 hours, and the test is discontinued as soon as it is positive. However, a negative reaction can only be reported after 72 hours. After the test the fish is placed in a tank with fresh water for recovery. Regression of the ovipositor following a positive reaction

takes about two weeks. After three weeks the fish can be used again. The fish which we used was the European bitterling (*Rhodcus amarus*).

RESULTS

1. Twenty-eight urines of women known to be pregnant were tested. Of these, 26 gave a positive reaction within 24 hours, while 2 gave a positive reaction within 48 hours. All the reactions were definitely positive.

2. Fourteen urines of women normally menstruating and definitely not pregnant were tested. Three gave definitely positive reactions within 24 hours, while 1 gave a slightly positive reaction, the ovipositor reaching a length of about 10 mm. within 24 hours. Ten samples gave definitely negative reactions.

3. Fourteen urines of normal males were tested. Three gave a positive reaction within 24 hours. These three cases were tried again on several other fish, all giving a positive reaction.

4. Fourteen urines of female children, aged 6 to 8 years, were tested. Two gave a definitely positive reaction in 24 hours. These were tested over again, each on several fish, and gave positive reactions in 24 hours.

5. Twelve urines of women for at least five years in the post-climacteric period were tested. Three showed a positive reaction in 24 hours and 1 a positive reaction in 48 hours.

6. Ten urines obtained of women while menstruating were tested. One gave a definitely positive reaction in 24 hours, and 1 a definitely positive reaction in 48 hours.

7. Eight urines of women pregnant only two months or less (pregnancy is definitely ascertained now) gave definitely positive reactions in 24 hours.

DISCUSSION

From the above experiments it can be seen that a positive reaction in the test can by no means be considered as reliable. However, none of the urine samples obtained from women, definitely pregnant, gave a negative reaction. We are not prepared to discuss the substance or hormone responsible for the reaction: however, this substance seems to be regularly present during pregnancy. The fact that some male urines and some urines from women definitely not pregnant are capable of giving the same reaction proves that we are not dealing with a specific test for pregnancy.

The experiments were carried out during the months of May to September, that is, the fish responded outside the breeding season to the test, just as well as during it.

* From the Department of Experimental Medicine of the Woman's General Hospital, Montreal.

I wish to thank Mr. C. W. Coates, of the New York Aquarium, for his kind assistance in supplying us with the bitterlings for this work.

REFERENCES

1. KANTER, A. E., BAUER, C. P. AND KLOWANS, A. H.: A new biologic test for hormones in pregnancy urine, *J. Am. M. Ass.*, 1934, 103: 2026.
2. TOZAWA, T.: Experiments on the development of the nuptial coloration and pearl organs of the Japanese bitterling, *Folia Anat. Japon.*, 1924, 7: 407.
3. FLEISCHMAN, W. AND KANN, S.: Ueber eine Funktion des weiblichen Sexualhormons bei Fischen (Wachstum der Legeröhre des Bitterlings), *Arch. f. d. ges. Physiol.*, 1932, 230: 662.
4. SZUSZ, F.: Research conducted with *Rhodeus amarus* for determination of early pregnancy, *Orvosi Hetil.*, 1935, 77: 905. *Ibíd.*, Untersuchungen mit Bitterlingen zur Erkennung der Schwangerschaft, *Monatschr. f. Geburtsh. u. Gynäk.*, 1934, 96: 292.
5. KLEINER, I. S., WEISMAN, A. I. AND BAROWSKY, H.: An investigation of the new biologic test for hormones in pregnancy urine, *J. Am. M. Ass.*, 1935, 104: 1318.

A SIMPLE DEVICE FOR DRYING BLOOD DILUTING PIPETTES

BY M. C. DINBERG, B.S.,

Kingston, Ont.

A simple, efficient, and easily available apparatus for drying blood diluting pipettes can be made from an ordinary 10 or 20 c.c. glass syringe and a short length of fine rubber catheter tubing.

Where an appropriate suction or blower apparatus is not available, the cleaning and drying of pipettes presents an annoying, though minor, problem for physicians and medical students who do blood counts and haemoglobin estimations with a limited supply of pipettes. The usual procedure in cleaning pipettes is to use water, alcohol, and ether, in that sequence. Following the ether, dry atmospheric air must be drawn through the pipette to insure the complete removal of moisture. As a result, the operator expends considerable time and energy in drawing air through the fine capillary bore of the pipette, and invariably receives a liberal mouthful of ether fumes before the pipette is thoroughly dry. To obviate this unpleasant occurrence, the writer uses a syringe to which is attached a short length of rubber tubing, with the following procedure. Any diluted blood remaining in the pipette is expelled. Water is then drawn into the pipette and rejected. This is followed by acetone which works wholly as well as alcohol and ether with the advantage of shortening the procedure by one step. After the acetone has been almost completely expelled, the pipette is fitted to the free end of the rubber tubing attached to the syringe. A few rapid strokes of the syringe plunger usually suffices to

dry thoroughly the capillary portion and bulb of the pipette. With this simple device, in the absence of a vacuum pump, a number of pipettes may be cleaned and dried in a very short time, without the necessity for inspiring mouthfuls of pungent acetone or ether fumes.

A RAPID METHOD FOR THE IDENTIFICATION OF DIPHTHERIA BACILLI: ALSO A NEW METHOD FOR IDENTIFICATION OF CARRIERS OF DIPHTHERIA BACILLI

In performing the rapid culture method M. B. Brahdy, M. Lenarsky, L. W. Smith and C. A. Gaffney, proceed as follows: Sterile cotton swabs are impregnated with undiluted unheated horse serum to which no preservative has been added. The swabs are then squeezed lightly against the sides of the tube to remove any surplus serum. They are removed and lightly heated over a flame to obtain surface coagulation, and, possibly, as Solé states, to destroy any antibodies in the serum. The swabs are then used to take the nose and throat cultures in the routine manner. Instead of being implanted on a culture medium the swabs are put in dry sterile tubes, placed in the incubator, and examined at the end of two and four hours. The physician's vest pocket may serve as an incubator. At the end of the incubation period, smear preparations are made on slides directly from the swab. The optimal incubation period was found to be four hours. The results in 68 cases of clinical diphtheria are recorded. In order to determine more accurately whether diphtheria bacilli were present and, if so, whether they were virulent, the authors developed the following technique. A four-hour rapid culture was transplanted to a Loeffler slant and incubated for eighteen hours. Colonies were fished from the Loeffler slant and examined. If diphtheria bacilli were present, the growth on the Loeffler medium was emulsified and used immediately for an animal test for virulence. The intracutaneous test in guinea-pigs was employed as a routine. In comparison with the methods used until now, they state that their new method gave more uniform results in the morphological identification of diphtheria bacilli. To obtain a culture pure enough for animal inoculation, the old methods require subcultures on agar plates, which are time consuming and, as a result, a minimum of five days is necessary for a virulence test. By the rapid culture transplant method a growth pure enough for animal inoculation is obtained within twenty-four hours, thus saving from two to five days in performing a virulence test.—*J. Am. M. Ass.*, 1935, 104: 1881.

Editorial

THE DIAGNOSIS OF CORONARY DISEASE

CORONARY disease may exist for a time without any subjective or objective evidence of its presence. Sooner or later, however, signs and symptoms appear which are of great significance. These are, moreover, many in number and variable in character. They may be associated in different combinations; some few may dominate the picture at any stage or at all stages of the disease; one or more of them may be unobtrusive or absent altogether. Consequently, the diagnosis of coronary disease may be easy, difficult, or impossible, depending partly on the stage at which the process has arrived and partly on whether the manifestations are typical or atypical. It is, however, highly desirable that an accurate and complete diagnosis be arrived at, for on this depend the proper treatment of the case and the prognosis.

Bell and Clawson¹ found at autopsy that sclerosis of the coronary arteries was present in 90 per cent of patients who had suffered from hypertension. Hypertension, then, is the red light on the highway leading to coronary occlusion.

Coronary disease may be suspected when a person in the middle or last third of life notices that he has dyspnoea or uncomfortable palpitation on a degree of exertion which previously had caused him no discomfort. The existence of hypertension is corroborative evidence. The disability increases until we get positive evidences of heart failure—enlargement of the heart, oedema of the lungs, anasarca, ascites, congestion of the liver, any or all of these. Such are examples of so-called "chronic degenerative myocarditis" and constitute the largest group of coronary cases. Oille and Rykert² remark that "One of the most significant points to be realized in connection with coronary disease is that it shews itself chiefly by

the symptoms of a gradually failing heart rather than by angina or coronary occlusion". Before diagnosing coronary disease at this point, however, all other causes of cardiac decompensation should be excluded—congenital anomalies, valvular endocarditis, and fatty heart, to mention the chief. In the earliest stage, before there are any indications of cardiac failure or any complaint of pain, the only evidence of coronary disease may be some abnormality in the electrocardiogram, the most important point here being not so much a specific alteration in the tracing as frequent variations within a short space of time.

In the smaller group of cases where heart failure is not the predominating feature or only appears late coronary disease may be evidenced by attacks of pain (angina pectoris) or by the signs of myocardial infarction. Of angina pectoris we shall speak in a moment. Myocardial infarction is usually due to coronary occlusion, and this latter is usually due to thrombosis.

The manifestations of coronary occlusion are so well known, that, with one exception, we need not dwell upon them—severe persistent pain in the chest, of sudden or gradual onset, lasting from a few hours to a few days, with or without vomiting; dyspnoea; shock; pallor or cyanosis; sweating; a rapid, thready pulse; distant heart sounds; a new cardiac rhythm; a fall in blood pressure; pericardial friction; leucocytosis; pyrexia; and, in the cases not quickly fatal, cardiac decompensation. When these features are present, and especially when they develop in the proper sequence, the diagnosis is easy and certain. It is well to remember, however, that in not a few cases the symptomatology may differ from this classical syndrome, either quantitatively or qualitatively. For example, pain may be absent or trifling and some other feature or features may be to the fore—a sense of apprehension, marked dyspnoea, congestive heart failure, and the appearance of a pathological rhythm. Occa-

1. BELL, E. T. AND CLAWSON, G. J.: Primary hypertension, *Arch. Path.*, 1928, 5: 939.

2. OILLE, J. A. AND RYKERT, H.: The clinical manifestations of coronary disease, *Canad. M. Ass. J.*, 1935, 32: 35.

sionally, acute œdema of the lungs may dominate the picture and terminate the scene quickly. Very rarely, there may be no obtrusive features.

Of all these manifestations pain is probably the most insistent, and, certainly, deserves some detailed consideration. First, we should like to comment on the present-day use of the term "angina pectoris", which is, we think, quite unjustifiable. In England authorities like Lewis and Parkinson use the term to include coronary thrombosis, calling "angina pectoris" the "angina of effort" and "coronary thrombosis" the "angina of occlusion". In Canada and the United States the term "angina pectoris" is usually restricted to pain on effort, and is used to denote such pain anywhere in the body from the third cervical to the eighth dorsal segmental area. In 95 per cent of cases at least this is due to coronary disease. All this is confusing. There seems to us no sufficient reason for discriminating between "angina of effort" and "angina of occlusion" (sometimes called also "angina of rest"), for patients who have suffered from angina of effort may subsequently develop the angina of rest. Moreover, anginal pain, whether of effort or of rest, is not always the result of coronary disease. It may be extra-cardiac in origin, or even extra-thoracic. Angina pectoris, pain in the chest, "breast-pang", is, after all, only a symptom which may be due to a number of widely differing conditions; it is not a disease entity. The term "angina pectoris", therefore, should not be linked up arbitrarily with any one pathological condition. To do so is merely to make confusion worse confounded. The term "angina pectoris" is used here in its general sense, that of a painful feeling of constriction in the chest, with the realization that such distress may be due to any one of several causes, or to no discoverable cause.

Angina pectoris need not be described in detail; its general characters are known to all. The pain comes on suddenly, develops gradually, and gradually fades away; it is most frequently located in the mid-line and radiates more or less widely. Radiation to the arm is important in diagnosis as it almost certainly excludes an abdominal lesion; it, however, does not prove that the chest pain is of cardiac origin. As Doctors Oille and

Rykert (*loc. cit.*) point out, the important diagnostic feature is that the distress is a response to effort or excitement. When the angina of rest is met with coronary thrombosis should always be thought of. Further, coronary disease should not be diagnosed until all other possible causes of the pain have been excluded.

Pain in coronary disease is a variable symptom, even in the advanced condition of infarction of the heart. It is probably more often absent than present. Nuzum, Elliott, and Evans³ in a study of one hundred and fifty-five patients with hypertension in whom there was clinical evidence of coronary disease found electrocardiographic changes in 19.6 per cent; cardiac asthma in 12.2; angina pectoris in 12.2; and coronary occlusion in 5.1. Saphir *et al.*⁴ in their study of thirty-two cases of coronary thrombosis, found that in only four was there a history of pain during rest. They note also, as have others, that attacks of pain typical of infarction might occur in the absence of this lesion. In their opinion the location, severity and duration of the pain are unreliable guides in diagnosis.

When we meet with a case of angina pectoris we should ask ourselves the following questions:—(1) Is the pain due to some condition, apart from coronary disease, which interferes with the supply of good blood to the heart? Such include aortic insufficiency, myxœdema, and pernicious anæmia. Examination of the cardiovascular system, determination of the basal metabolism, and examination of the blood are the chief measures required to establish the diagnosis. Toxic factors should also be thought of, both bacterial and non-bacterial—tobacco, lead, influenza, rheumatism, intoxication from the alimentary tract. Obesity and malnutrition may play a part, endocrine disorders, and the menopause.

(2) Is the pain of abdominal origin? Coronary thrombosis may closely simulate acute surgical conditions in the upper ab-

3. NUZUM, F. R., ELLIOTT, A. H. AND EVANS, R. D.: Clinical and pathological study of coronary sclerosis: incidence in hypertension, *Am. Heart J.*, 1935, 10: 367.

4. SAPHIR, O., PRIEST, W. S., HAMBURGER, W. M. AND KATZ, L. N.: Coronary arteriosclerosis, coronary thrombosis, and the resulting myocardial changes, *Am. Heart J.*, 1935, 10: 567 and 762.

domen^{5,6}; conversely, symptoms and signs due to abdominal disease may simulate coronary disease—cholelithiasis, perforated peptic ulcer, diaphragmatic hernia, colitis and sigmoiditis being the most important conditions^{7,8,9,10}. The points in differential diagnosis are too numerous here to be detailed.

(3) Is the pain of thoracic origin, but extra-cardiac? In this case pain suggestive of angina pectoris may be due to some disorder of the skin, muscles, nerves, bones, œsophagus, diaphragm, and mediastinum. Herpes, myositis, intercostal neuralgia, pleurisy, spondylitis, and sub-acromial bursitis are to be thought of here. The first four mentioned present little difficulty in diagnosis. The pain most commonly mistaken for angina is that due to spondylitis. It is usually unilateral, almost never in the

mid-line, and may occur in several places in the chest. It is often related to position in bed, and is induced by some special movement rather than by exertion such as walking. Such pain may radiate as far down as the lower ribs. Pain due to sub-acromial bursitis often radiates to the precordium spontaneously or on lifting or rotating the arm.

Arteriosclerotic dilatation of the arch of the aorta, aneurysms of the aorta (notably, the dissecting form), and pulmonary embolism, with acute cor pulmonale, may give rise to pain closely simulating angina pectoris and, even the clinical signs of coronary thrombosis.¹¹ Skiagrams of the chest will help to determine the size of the heart, the existence of aneurysms, calcification of the vessels, and chronic arthritic changes. The existence of a thrombophlebitis somewhere, signs of pneumonia, and bloody sputum, with pyrexia will afford a clue in the case of pulmonary embolism. The resemblance to coronary occlusion is rather close.

By exclusion, then, we can come at a diagnosis of coronary disease, but, as will have been gathered, an exhaustive examination will have had to be made, presupposing an intimate knowledge of the disorders of many systems.

5. HERRICK, J. B.: Clinical features of sudden obstruction of the coronary arteries, *J. Am. M. Ass.*, 1912, 59: 2015.
6. LEVINE, S. A. AND TRANTER, C. L.: Infarction of the heart simulating acute surgical abdominal conditions, *Am. J. M. Sc.*, 1918, 155: 57.
7. ROBEY, W. H.: The differentiation between gall-bladder disease and coronary sclerosis in the middle-aged, *Med. Clin. of N. Am.*, 1925, 8: 1709.
8. BARKER, P. S., WILSON, F. N. AND COLLIER, F. A.: Abdominal disease simulating coronary occlusion, *Am. J. M. Sc.*, 1934, 188: 219.
9. HAMMAN, J.: Remarks on the diagnosis of coronary occlusion, *Ann. Int. Med.*, 1934, 8: 417.
10. ERNSTENE, A. C.: The differential diagnosis of coronary artery disease, *Cleveland Clinic Quart.*, 1935, 2: 22.

11. MCGINN, S. AND WHITE, P. D.: Acute cor pulmonale resulting from pulmonary embolism: its clinical recognition, *J. Am. M. Ass.*, 1935, 104: 1473.

THE MEDICO-LEGAL ASPECT OF ARSENICAL POISONING

A RECENT murder trial (Crown vs. Chapdelaine) has been the occasion for reviewing the medico-legal aspects of arsenical poisoning. In this case, briefly, a woman was charged with the murder of her husband by means of arsenic. The circumstantial evidence was strongly against her; she had had large quantities of arsenic in her possession, and her husband exhibited all the clinical signs that might have been caused by an overdose of this poison. The crown examiner, however, had been unable to find any arsenic in the body tissues, and the defence readily seized on the point: it was on this that the medico-legal interest was centred.

In reply, the prosecution pointed out that

they were not bound to show that the body still contained the arsenic. They contended that it could pass out of the body a short time after ingestion, and, when pressed on the point, they brought forward certain statements in medical literature which seemed to support their contention. These statements had their origin in four cases which began with that of the Crown vs. Williams, in 1863, in which murder by administration of arsenic was proved, but still none of the poison was detected in the body of the deceased. This is described in Taylor's *Principles and Practice of Medical Jurisprudence* (Vol. 2, p. 323). Another case was that of a Rev. James Alexander, who died sixteen days after a large dose of arsenic,

and yet the post-mortem examination revealed no arsenic in his body. The third case was one reported to the Royal Commission on Arsenical Poisoning, and in this, again, the post-mortem report showed no trace of the poison. The fourth instance of the kind was another trial case for arsenical poisoning, in connection with which a medical expert stated that in his experience a person might die speedily after taking a large dose of arsenic, and yet not a trace of solid arsenical compound be found in the viscera.

Now these four examples have been enshrined in practically every edition of standard books on medico-legal work, and, naturally, are of very great significance in trials for murder by arsenical poisoning. But the trial under discussion has served to entirely discredit their value. The defence called in Dr. I. M. Rabinowitch, of Montreal, to testify, and he showed, definitely and irrefutably, that arsenic never passes out of the body entirely after enough has been taken to cause death. He showed that in all of the above-mentioned four cases the post-mortem examinations had been incomplete. In none of them had the hair, skin, nails or bones been examined, and yet it is well known that some arsenic is always taken up into one or other of these tissues, and in the hair, unless this has been cut, it remains

indefinitely. Dr. Rabinowitch took the trouble to look up the original post-mortem reports in these cases, and found that in each instance the abdominal viscera only had been examined. On his own experience, he challenged the Crown to cite a single case in any language or in any textbook in which no arsenic had been found in the body of a person dying of acute arsenical poisoning, *when all the tissues had been examined*. It is, of course, well recognized that the abdominal viscera may show none of the poison even after large doses, because it soon leaves them, some to be eliminated by the kidneys, and some to be taken up by the skin, nails and hair.

We hope that this expert evidence will serve to show that these textbook statements are misleading. It should be laid down once and for all that large doses of arsenic always leave traces that can be detected, if *all* the tissues are examined. When that is recognized it will be impossible to charge anyone with murder by arsenical poisoning in the absence of arsenic in the body of the victim. It was only the persistence of Dr. Rabinowitch in this case that finally enabled the defence to win an acquittal for the accused woman, although she had been convicted twice and twice sentenced to be hanged.

H. E. M.

THE RELATION OF CLIMATE TO TUBERCULOSIS

THE value of climate in the treatment of pulmonary tuberculosis has not yet been definitely ascertained. There was a time when the impression was unquestioned that altitude and a dry atmosphere were factors of almost supreme importance. Now it is felt that there are so many other factors in the treatment of tuberculosis that climate must no longer be assumed to have such an overwhelmingly vital influence. Neither view, however, has ever been clearly analyzed. Cowles and Chapman* point out that most of the reports on the subject seem to indicate that altitude is of definite importance. For example, they quote Gardiner *et al.* as concluding that the high inland

plateau region of the United States apparently owed its remarkably low death rate from tuberculosis, in considerable part, to climatic factors; also Treutlein, as saying that the proportion of tuberculous cases in Bolivian hospitals at altitudes of 6,000 to 12,000 feet declined sharply with increased altitude. Other reports, however, show evidence of disagreement, although in any case Cowles and Chapman state that none of the studies so far are convincing from a statistical point of view, since the variable factors in the matter have not been given proper consideration.

In their own study they have tried to estimate the significance of the climatic factor, and in doing so have considered the other factors which affect the variations in death rate from tuberculosis, that is, amongst the

* A statistical study of climate in relation to pulmonary tuberculosis, *J. of Am. Statist. Assoc.*, 1935, 30: 517.

white populations of various states in the United States. The large number of 150,000 deaths from pulmonary tuberculosis was investigated by statistical methods. Briefly, the result of their inquiry is as follows. It was found that there were nineteen elements of possible significance in the death rate, but six of these combined to act as major factors in the variation of the death rate amongst the various states. One of these factors was the proportion of coloured population. There was a considerable direct relationship to the tuberculosis death rate for the white population in the case of thirty-three states with less than 19 per cent negroes. In nine southern states, however, with more than 25 per cent negroes this relationship is different. It is suggested that this is due to the segregation of the coloured population in these states being stricter than in those with a less acute race problem. Other factors were high standards of education, as reflected chiefly in the literacy of the white

population, along with per capita expenditures in elementary and secondary schools. As regards climate, the only element which seemed to be of definite significance was the number of hours of sunshine. The other climatic elements considered to be of any possible significance were precipitation, daily temperature range, and altitude. The last named showed no special significance.

We must not look then for any markedly preponderant element amongst the many factors which affect the progress of tuberculosis. All that the authors will permit themselves to conclude is that, in so far as the states of the United States are concerned, high standards of education and minimizing the risk of infection from negroes, combined with life in a sunny, dry, and high climate, would seem to be far more important than other elements, such as large per capita income or low population density, in reducing the white death rate from pulmonary tuberculosis.

H. E. M.

OUR MEDICO-LEGAL DEPARTMENT

FOR rather more than a year the *Journal* has been publishing as one of its regular monthly features digests of court judgments of medico-legal interest. In that time some twenty important pronouncements of the kind have appeared. It is hoped and believed that these judgments are of sufficient importance to the medical profession to warrant their being reported in future issues.

A word at this time as to the method by which our abstracts or digests are prepared and their purpose will not be out of place. In all the provinces of Canada the more important written judgments of the courts are published in "Reports", official and otherwise. To these the lawyer has recourse when he seeks for precedents. Upon these have been based most of the digests that have appeared in the *Journal*. For convenience of reference a summary of the digest is printed in italics at the beginning. This is what the lawyers call "the headnote". The references in the footnotes are to the date, volume, and page of the particular report from which the digest has been made. The digests do not purport to be anything more than summaries of the judge's opinion,

with his reasons. The reporter rarely permits himself the luxury of personal comment, and when he does so his comment is so phrased as to be easily distinguishable from the judgment proper.

It happens, however, that a proportion of the judgments rendered do not get into the official reports. Those that do not, and among them are many of interest to the medical man, are to all intents and purposes lost in the archives of various court-houses from coast to coast. The *Journal* could perform an additional service if it could get track of these. Unofficial reports of this kind, when carefully prepared, have before now attained such a reputation for accuracy that they can be quoted in court as authority. Examples of this are the legal reports that have appeared in the *London Times*. For our *Journal* to provide this service it needs the cooperation of the medical profession. If the medical practitioner who knows of a judgment in a medico-legal case which has not been officially reported could furnish us with an accurate copy, or at least inform us as to where such could be obtained, we could have the case digested by our legal corre-

spondent. The cases officially reported are, of course, readily accessible to us.

In order to make its Medico-legal Department still more useful the *Journal* intends to inaugurate a new feature. It proposes to publish from time to time summaries of the Statutes passed by the Federal and Provincial Legislatures which relate to medical practitioners, nurses, pharmacists, and hospitals. As we all know, a feature of government today is the growing tendency of our legislators to interfere in the concerns of the individual and of aggregations of individuals. Whether this is a good thing or a bad thing is not for us to discuss here. Examples of regimentation as it concerns groups are particularly to be found in what has come to be

called "social legislation", including, for example, minimum wage laws, unemployment and social insurance Acts, hours of work Acts, collective labour agreements and so on. Of particular importance to the medical profession are the various proposals designed to implement "state medicine". It is obviously of great importance that we should keep ourselves informed about legislation that affects our personal and professional interests. Our medico-legal column is designed, therefore, to keep our members awake to the many pitfalls that attend the practice of medicine, to shew how these may be avoided, and to keep them posted as to legislation which affects their duties, rights, and interests.

A. G. N.

Editorial Comments

I. P. Pavlov

On February 27, 1936, Ivan Petrovitch Pavlov, one of the greatest of physiologists, passed away in his 87th year. The scientific heritage which he has left us is indeed stupendous. Its value lies not only in the multitude of new facts which he discovered but even more in the new methods which he worked out, and which led him, and will lead generations of physiologists, to a better understanding of the complex machinery of the animal body. Even a few of the physiological facts established by Pavlov would have been sufficient to rank him among the foremost physiologists—such discoveries, for example, as the augmentor effect of the sympathetic nerve on the heart beat (made independently of Gaskell); the innervation of the gastric and pancreatic glands; the characteristics of the salivary, gastric, pancreatic and other glandular secretions; the discovery of enterokinase, and so on. These and many other of Pavlov's findings are now included in every textbook of physiology, often without any mention of his name. They have become a matter of common knowledge—a proof of their fundamental value.

But Pavlov's genius found magnificent expression in another direction also. Study of his work reveals that he always employed a new method of approach to any problem on which he was engaged. Thus he was the first to realize fully that the method of "acute experimentation" with anesthetized animals, valuable as it is, has yet great drawbacks. He therefore introduced "physiological surgery", and the first aseptic department for operations on animals was established in his laboratory in the

"nineties" of last century. This has now become a necessary adjunct to every physiological and experimental-pathological institution. Pavlov owed his success in investigating the function of the alimentary canal (and the Nobel prize, awarded to him in 1904) very largely to the use of "physiological surgery" in the study of this problem.

Even more startling than these achievements was the application of physiological methods of investigation to the study of the function of the cerebral hemispheres, *i.e.*, by means of "conditioned reflexes". This method of approach may indeed be considered a revolutionary one, for in a province of science hitherto regarded as the almost exclusive domain of psychology Pavlov ventured to employ physiological methods of investigation and to evaluate his results from a purely physiological point of view. It is too early yet to estimate the full value of this bold stroke of genius, but it must be positively stated that Pavlov's thirty years' study of the function of the cerebral hemispheres in the dog by the method of conditioned reflexes gave science its first insight into the true physiology of the highest part of the central nervous system. The conditioned reflex method is now firmly established in physiology. It has already become in the hands of many investigators one of the most useful tools in the study of phenomena occurring in the cerebral cortex. The influence of Pavlov's work on conditioned reflexes is also being noticeably felt in psychology. There is very little doubt that in time it will influence more and more not only the psychologists but the psychiatrists, pedagogues and sociologists as well.

Pavlov was born on September 26, 1849, in the provincial city of Riazan. He graduated first from the science faculty of the University of St. Petersburg, and afterwards (in 1879) from the Medico-Chirurgical Academy. He studied physiology under Professor E. Cyon, in Russia, and under Professors C. Ludwig and R. Heidenhain in Germany. In 1890 he became Professor of Pharmacology, and in 1895 Professor of Physiology, in the Military Medical (formerly Medico-Chirurgical) Academy, St. Petersburg. In 1890 he had also been appointed head of the Department of Physiology at the Institute of Experimental Medicine, a position which he held till the day of his death. Most of his work came out of this laboratory. Himself the son of a clergyman, he resigned his chair of physiology at the Military Medical

Academy in 1924 as a protest against the persecution of the children of the clergy by the Soviet authorities, who denied them the right of entering the universities. He was a member of the Russian Academy of Science, of the Royal Society of London, and of many other learned societies and universities throughout the world.

The life of Pavlov was not rich in adventure in the usual sense of the word, but it is a fascinating record of the adventures of a mind untiring in the search for truth. To his uncompromising devotion to science and his steadfast faith in it as one of the guiding principles of life may be ascribed the great achievements which will cause the name of Pavlov to be remembered for ever.

B. P. BABKIN

Special Articles

OBSTETRICS IN RURAL SASKATCHEWAN:

WITH SPECIAL REFERENCE TO THE QUESTION
OF MIDWIVES

BY ISABEL STEWART, Reg. N.

Director of Red Cross Outpost Hospitals,

Regina, Saskatchewan

Saskatchewan with its great distances, its racially mixed population, its extremes of temperature, and its economic tribulations, should be a suitable place in which to consider the employment of midwives as the solution for the high maternal death rate. The average maternal death rate in the Dominion of Canada for the six years 1928 to 1933 is 5.3; the average maternal death rate for Saskatchewan in the same time is 5.2.

Many panaceas have been suggested to cure this ill. The provincial government has given a maternal grant to needy mothers; professors in medical colleges have stated that doctors need more obstetrical training; and public health authorities from other countries, especially those from England, have stated that the solution to this problem is the employment of midwives. It is with the discussion of this last solution that we are here concerned.

The trained midwife, as we know her, must be imported, because we have no training centres in Canada for her. In order to open our medical schools for the training of midwives in the classes with our medical students, a determined wave of public opinion would have to beat upon the heads of our medical colleges. With clinical material for teaching of future doctors already somewhat inadequate, the professors would not welcome the task of finding

more opportunities for the practical teaching of women to be midwives, and, in a small sense, rivals to the doctors. With conditions as they are at present and as they are likely to remain, midwives trained abroad would be our only source of supply.

People who arrive from the British Isles have adjustments to make in meeting new and different living conditions in Canada. The professional midwife would have to pass through the same period of adaptation. She could not find her feet all at once, and the going might be very rough at first. Those from countries other than the United Kingdom might have the additional handicap of language. But if midwives are the solution and public opinion demands midwives Canadian women could be trained in this work.

Let us consider Saskatchewan's need. The eight cities which contain one-sixth of the population are well supplied with practising obstetricians and adequate hospital accommodation. In the two larger cities, Regina and Saskatoon, which contain one-ninth of the province's population, there is an organized visiting nursing service, the Victorian Order of Nurses, which assists the doctor during confinement in the home, gives daily care to mother and baby for the first ten days, and weekly supervision for six weeks. Seven of the cities have public health nurses doing general public health work. The services of these nurses are available alike to rich and poor, but they are especially appreciated by the people who through the vicissitudes of fortune find themselves on evil days financially. Organized municipalities have legislative power to provide through taxes free medical service to all taxpayers. This would cover maternity cases. The provincial government gives maternity grants to rural indigent mothers; an extra sum

is given the physician if a prenatal examination is made and also another little extra if a post-natal examination is made six weeks after delivery. Thus indigent patients receive a certain amount of prenatal and postnatal care and medical attendance at confinement at no expense to themselves. Physicians in some of the frontier districts are subsidized by the government to give medical care in all cases. Without this subsidy it would be impossible for many districts to have any medical care because of the inability of the people to pay. A midwife, subsidized for maternity work, would be qualified to care for only one type of case; the doctor is subsidized to care for everything from maternity cases to fractures. An adequate midwife service in rural Saskatchewan would involve the problem of transportation. Difficulties encountered would be distance, temperature, and blocked highways. The overcoming of these all involves the expenditure of more money, and if money is to be spent transporting someone why not transport someone who can assume full responsibility, namely, a doctor? There are eighty-eight hospitals, not in cities, which care for maternity cases. Thus we see that in the cities and in the well settled municipalities adequate provision is made. The great need for medical help appears in the frontier and homestead land. In 1933 there were 5,886 babies delivered in Saskatchewan (28.6 per cent of all births) without the attendance of a doctor or a nurse.

Has anything been done to meet this need of the pioneers? In 1920 the Saskatchewan Red Cross as part of its peace-time program opened small hospitals in homestead country, with the care of new mothers as a first responsibility. The policy of the Red Cross is to establish a hospital in a remote and inaccessible settlement, to carry on the hospital for some years, in order to demonstrate to the community how a hospital should be managed, and, later, when affairs are running smoothly, to withdraw and let the community carry on the hospital as its own responsibility. Since 1920 nineteen of these outpost hospitals have been established. At present 6 are being administered by the Red Cross. Since 1920 these outpost hospitals have cared for 5,090 maternity patients. These are cases in isolated communities; many of the women, because of poverty or distance, or both, had no prenatal care. Of these 5,012 were confined in the hospitals and 78 in the homes by the Red Cross nurses. There have been 14 maternal deaths, a rate of 2.7, which is about half as high as the general rate in the province.

The physicians who attended these cases have not had special training in obstetrics; they are average, hard-working, sensible, practical country doctors. Possibly they have a better stock to work with than the city doctor. Certainly, the mothers have no luxuries, no running water, no electrical appliances, plenty of lifting, plenty of bending, gardens and hens to tend. How-

ever, the V. O. N. nurses working in the cities of Canada have an equally good record. In the last five years the V. O. N. nurses have assisted the physicians with 14,000 confinements in Canada. The average maternal death rate in these cases is 2.1.

The Red Cross Outpost Hospitals admit patients who live within a radius of 40 miles, all in newly settled country. The inability of the patients to pay for medical care is one of the factors considered in placing a new outpost hospital.

Analysis of the 14 maternal deaths shows that influenza was the chief cause of death of two patients admitted in labour. One of these had a temperature of 104° on admission, was delivered six hours later, and died three hours after delivery. The other was admitted with a temperature of 102°, was delivered ten hours after admission, and died on the following day. Two other patients died of pneumonia. One, who was admitted with a temperature of 103°, went into labour four hours after admission, and died the third day after delivery; the other, admitted in labour with a temperature of 104°, died the third day after delivery. Two of these four cases had no prenatal care; they were ill at home for several days before admission. Two patients died of embolism, one on the tenth day and one on the eleventh day; both patients had been out of bed, both had a normal puerperium and died within a short time after the onset of the attack. One patient died of hemorrhage at delivery. She gave a history of not having "felt life" for some weeks before entering the hospital in labour, and had had no prenatal care. Three died of eclampsia. One was admitted in eclamptic coma and died in four hours; another developed convulsions on the way to hospital in labour, delivered a live child, and died in two hours. The first eclamptic had had no prenatal care; the second had not had any prenatal care for the last four weeks because of the great distance from the doctor; the third eclamptic died twenty-four hours after admission; she had not had prenatal care. Two patients died of shock following long, protracted labours. One died of heart failure on the fourth day. One patient of German nationality, in Canada for only one year, had had no prenatal care, had a normal labour, but was obsessed with the idea that death was inevitable because her mother and her maternal grandmother had both died following the birth of the first baby. Delivery was normal and comparatively easy. There was no elevation of temperature. In spite of all that could be done to improve her mental condition she died on the thirteenth day.

Of these cases the three eclamptics, with prenatal care, might have been saved, but a midwife placed in the district would possibly not have been in any closer touch with them than a doctor. If the pneumonia patients had remained at home they might have had a chance.

Both of them had intended to remain at home, but when fear entered their minds they came to the hospital. The long drive in winter may have increased the burden on a lowered resistance. The two cases of influenza were unforeseen complications. In small, badly ventilated homes the conservation of warmth is a matter for consideration. It is almost impossible if one of the family develops an infection to keep the others isolated.

The cases of hæmorrhage and shock at delivery would be much more adequately handled in a hospital than in one of the small, crowded homes. In the case of the primipara who knew she was going to die everything possible was done to distract her attention, without any mental improvement. It is not known whether the mother and grandmother were attended at home or in hospital.

A midwife, with the best personality, adequately trained, in a new district just opening up, would often be faced with the physical impossibility of being in two places at once. Two or more patients can be easily cared for at the same time in a small hospital. The low temperatures and the snow in winter with blocked roads all make the time spent in transport long and difficult. Many of the homes are small and without adequate comfort for well folks, and with no provision for space or privacy for the sick, let alone accommodation for anyone in the guise of a nurse, no matter how effacing she might be. The mother, worried and bothered by the smaller children, not wishing anyone to know how bare her linen cupboard is, or how empty her pantry shelves may be, does not welcome the idea of being sick at home. In the small hospital with all responsibility for food and for the petty troubles of the smaller children off her mind, the mother, in a comfortable bed, waited on by kind hands, finds herself sleeping peacefully through most of the day in strange surroundings.

Those who come to Canada from Europe, where the work is being done in homes by midwives, are unaccustomed to leaving the small children and going to hospitals, but they soon become used to the idea. The cold winters are new to all but those from the northern countries of Europe. These people realize how low the temperature of their little shack often becomes in the middle of a winter night, and realize that for the sake of warmth, if not for space, the sleeping accommodation must be all in one room. Few of the new homes boast an upstairs, and the heaters used cannot distribute an even heat.

The new Canadian is persuaded to come to the hospital for the first baby, and there is something wrong with the nursing staff if the idea of the hospital, rather than the home, as a place for the arrival of the new baby is not firmly fixed in the mother's mind after her first experience. Occasionally a patient comes in to have a seventh or eighth or tenth child on

her first stay at the hospital. She is a bit shy and uncertain of hospital procedure, but with hospital conveniences around and with no confusion young Canada arrives. A sense of relief passes over the mother when she realizes how little responsibility she has had to assume. After she goes home she tells all her neighbours what a fine place the hospital is.

We feel that whatever the solution of the high maternal death rate in Canada may be it does not lie in the employment of midwives who go from home to home delivering normal cases. Because a certain method of maternity care suits the crowded, thickly populated centres of Europe it does not follow that it will suit a thinly populated country where transportation is difficult. Let us work together as thoughtful people and apply our energies to finding a reasonable solution of this ever-present and difficult problem, the yearly loss of young mothers.

* * *

COMMENT BY DR. T. A. PATRICK, YORKTON,
SASK.

It is now almost forty-seven years since I became acquainted with what was then the northeastern part of the old provisional district of Assiniboia. Ever since that time I have been practising all branches of medicine in rural areas for miles hereabout. For eight years I had as my office nurse an English midwife, holding a certificate from the Central Midwives Board. After qualifying as a trained nurse she spent two years on her C.M.B. training. She went out into the country with me, and in every case proved the excellence of her training and her ability to rise to unusual occasions, yet never once did she express any desire to go out on her own as a trained midwife in Saskatchewan. She saw conditions as they were and are.

Rural residents are quite aware of the handicaps besetting the expectant mother in her home, and are more and more coming to the hospital in time. There is a distinct trend toward hospitalization under contract between the rural municipality and the hospital board. I cannot understand how any person who knows the difficulties of transportation over rural roads for many weary miles can be sure that what is adapted to conditions in the old country can be adapted to such very different conditions here.

The best armour of old age is an early life well spent in the practice and exercise of virtuous deeds. For when you are advanced in years your previous good actions bring a great reward, seeing that your habits of virtue still abide with you even in extreme old age. Moreover, the consciousness of a well-spent life and the memory of many kind actions is in itself a very sweet consolation.—Cicero.

THE ETHICS OF MEDICAL PRACTICE

By D. A. STEWART, M.D., LL.D.,

*Chairman of the Committee on Ethics
Ninette, Man.*

II. ANCIENT RULES AND MODERN RULINGS

The first specific question submitted to the new Committee of Ethics was one quite outside the scope of our early-Victorian Code. A company wishing to push the sale of its own special brand of a useful food element—orange juice—wished to engage a young physician to give radio talks on the usefulness of this food element. This propaganda would undoubtedly be focussed by the company, even if not by the physician, upon their own special product. In the reference to the Committee the statement was made that the doctor might by this means, in addition to payment, become better known and so likely improve his practice.

This question, submitted to the Committee members, has proved an interesting study. We first had to get wholly out of our minds any idea that we were a jury dealing with discipline, and focus our thinking on ideals and beauties and niceties of conduct and an appeal to conscience, not law. What the courts of the profession might do or not do was another matter. We had no prisoner at the bar. We were considering what way of life we all should follow, not a list of crimes a fellow-man might be hanged for. The question was not, is a certain course punishable, but, is it right?

When we got well away from any thought of discipline the Committee was practically unanimous that a paid advocacy of any commodity, for the gain of any company, however useful the commodity might be, was not a dignified or proper proceeding. Among the comments were:—"Not in the best interests of the profession or the general public," "Unwise", "Better not", "Derogatory to the dignity of the profession", "Deserving mild censure". This consensus it seems to me the profession in

general will agree with. A doctor on the radio boosting the use and sale of any one product would be an advocate when he should be a judge. A doctor is in his right place when he is standing beside the patient, and, with no possible bias, choosing out of all possible elements the very things that are best in all respects for this particular patient. A doctor is in a wrong position when he is standing beside a merchandiser and pushing any proprietary product as far as it can possibly go, for profits. Even such a harmless or useful commodity as orange juice would not be advised for people of all conditions, all ages, all pockets, and at all times. There may be cheaper substitutes—perhaps the juice of the humble tomato (either pronunciation). Quite apart from direct or implied advocacy of any special brand, is it fair that a doctor, a man of authority, from the housetops, or the modern equivalent, the air, should excite hard-up but conscientious parents to upsetting ideas of relative values of elements in their children's dietary, implying that an impossible one is the only right one?

Should a doctor ever become the paid agent of a merchandiser? This is very different from being a paid research worker in a commercial company, which can be quite as ethical and as valuable as any other service. Why do the merchandisers wish a doctor to give such radio talks? Simply because for twenty centuries the people have trusted doctors in such matters. They would take a doctor's advice as disinterested advice, which in this case it would not be. The first interest of a radio advocate is not the good of a patient but of a company. A doctor advocating a commodity generally is putting up for sale along with his commodity something that does not belong to him, the age-old inherited confidence of people in the medical profession. To sell a harmless or useful product in that way is not so bad as to sell nostrums, but the principle is the same. One Committee member thought quite appropriate the answer of a wife, when her husband asked if a collar could be worn again—"If it's doubtful its dirty".

HEART-BLOCK AND CORONARY DISEASE.—J. Salcedo-Salgar and P. D. White state that there is a marked discrepancy between the occurrence of auriculo-ventricular and intraventricular block and the clinical evidence of coronary disease, namely, angina pectoris and gross myocardial infection, basing their conclusions on 4,274 cases of cardiovascular disease. They found that only 8.8 per cent of 700 patients with angina pectoris uncomplicated by clinical coronary thrombosis showed heart-block, and that only 13.1 per cent of 328 cases of coronary thrombosis, with or without angina pectoris, had heart-block. Conversely, in 117 patients with auriculo-ventricular block there were only 9.4 per cent with angina pectoris without clinical coronary thrombosis, and only 11.9 per cent more had clinical evidence of coronary thrombosis with or without angina pectoris, totalling 21.3 per cent of cases of auriculo-ventricular block with clear evidence of coronary disease. In 181 cases of intraventricular block of all grades, including 77 cases of full left bundle-

branch block and 19 cases of full right bundle-branch block, 29.8 per cent showed angina pectoris without clinical coronary thrombosis, and 9.3 showed coronary thrombosis without angina pectoris; in all only 46.9 per cent of these cases of intraventricular block showed clinical evidence of coronary disease. Analyzing their results, the authors conclude that the coronary supply to the auriculo-ventricular node and bundle and its branches is not necessarily occluded as a result of the lesion (thrombosis or embolism) which blocks the coronary supply to the areas of the heart (anterior apical and posterior basal portions of the left ventricular myocardium) most commonly affected in clinical coronary thrombosis. They believe that such supply may be seriously involved by atherosclerotic or other processes with poor prognosis, even when there is no associated angina pectoris or clinical evidence of sudden blockage of the anterior descending branch of the left coronary artery or of the main branch of the right.—*Am. Heart J.*, Dec., 1935, p. 1067. Abs. in *Brit. M. J.*

Men and Books

THE CENTENARY OF SAMUEL BUTLER

By H. E. MACDERMOT,

Montreal

Samuel Butler (1835-1902) was one of those whose greatness did not receive full recognition during his lifetime. Perhaps this was because he aroused so much opposition and was too much in advance of his generation; although actually he was not so much in advance as that he was inclined to question and criticize, which he would have done in any generation. In any case, he died with little to show that he would be remembered for much longer, but within a few years his fame became solidly established and has remained so. The centenary of his birth occurred a few months ago and has been made the opportunity for recalling his remarkable personality.

Butler was one of the great amateurs, if that is to be taken as meaning one who does things only because he wants to do them; and he would probably have gladly accepted the title. It happened, however, that he wanted to do many diverse things. He composed music, although that is all that can be said of it, even if much of it was strictly imitative of his adored Handel. He painted (eleven of his paintings were exhibited in the Royal Academy), but his work will not live for its artistic value so much as because he was the painter. In biology and philosophy perhaps he would not have been so ready to be called an amateur. He wrote three books on evolution, and sharply opposed Darwin's explanation of the origin of species by natural selection. Whether his own contribution to the subject is to be considered of permanent value or not, it must at least be recognized as evidence of unusual mental qualities. Butler never could have developed the evolutionary idea with the completeness and mastery of Darwin, but that would have been due not to inferior qualities of mind so much as to differences in temperament. The two men cannot be compared; each had absolute honesty of mind, and there the common ground ceases. Butler made his mark in his own way, but he might have made it sooner and with more effect if his way had been less impatient and more tolerant. But then, again, how much of this hypersensitiveness was due to the torture of his childhood days and a father of whom he wrote: "I can call to mind no time that I did not fear him and dislike him. There can be no real peace or contentment for me until either he or I are where the wicked cease from troubling." In

The Way of All Flesh Butler has left us descriptions which show that his father's disciplinary methods bordered on the sadistic.

Still, with all the excuses and explanations possible, the fact remains that Butler's writings always have an astringency which, if quite effective in preventing them from being dull, is often enough too bitter to be pleasant. After all, even if a man does have a grievance against his father one always has a vague uneasiness in hearing him vilify him with such corrosive virulence as Butler displayed. And yet—what a father! His guiding principle was "Break your child's will early, or he will break yours later on".

Not that Butler has left a memory only of bitterness and eccentricity. Far from it. He was essentially a man of independent and forceful mind, and it was in asserting that independence that he found his greatest happiness. Without professional or technical training, he was always at odds with the views of the trained scientist and professional man. He was just as ready to attack the accepted views of science as he was those of religion, or literary subjects, or philosophy. Hence his opposition to Darwin, his defence of miracles, his theory that the author of the *Odyssey* was a woman, his satire on modern society in his famous *Erewhon*. He published *Erewhon* in 1872, and nothing that he wrote brought him as much fame during his lifetime; indeed, it was the only one of all his books on which he did not lose money. It was a satire, in an age when English satire had lost its effective teeth, and is to be added to that interesting list of famous books which were at first rejected by the publishers. George Meredith was the reader for the first publishing company to which it was sent, and he recommended its refusal on the ground that "it was a philosophical work and little likely to be popular with a large circle of readers." Butler said that he entirely agreed with him!

Butler concerned himself very little with medical matters. He had thought of taking up medicine once, influenced thereto by a friend, who was a homœopathist. But his desires got no further than the naming of his horse in New Zealand "Doctor". It must be added, however, that he said he hoped the animal was a homœopathist! However, *Erewhon* has ideas on public health that in his day were regarded as no more than exuberant eccentricities but now are commonplace. In *Erewhon* the sick were punished by law, and the criminals were sent to hospital or were visited by their "straighteners". Every student and every public health nurse ought to read the account of the trial by judge and jury

of a man accused of pulmonary consumption. The law was carefully explained to the criminal, and he was reminded that he had been previously convicted of aggravated bronchitis, and had already been punished many times. This time he was sentenced to life imprisonment.

Butler was not particularly anxious that people should believe in him. It was enough that he was able to set himself down freely in his limpid, acid style, and stir people up with his unexpected and often inconvenient ideas.

"Above all things," he wrote, "let no unwary reader do me the injustice of believing in *me*. In that I write at all I am among the damned. If he must believe in anything, let him believe in the music of Handel, the painting of Giovanni Bellini, and the XIIIth Chapter of St. Paul's Epistle to the Corinthians."

He shows this uncertainty about himself again in speaking of his book *Life and Habit*.

"I admit that when I began to write upon my subject I did not seriously believe in it. I saw, as it were, a pebble upon the ground, with a sheen that pleased me; taking it up, I turned it over and over for my amusement, and found it always grow brighter and brighter the more I examined it."

He was fond of Italy and spent much time in its smaller towns. Jones, his inseparable friend, tells us that once at Palermo they went to see the mosaics in the Cappella Palatina, for which there was an admission charge. The custode gave Butler a bad lira in his change, and they had words over it, but were unsuccessful in getting it replaced, the custode protesting with overwhelming volubility, first that it was a good lira, then that he hadn't given it to them, and so on, until they were almost convinced that they were dishonest themselves. On their way out, the custode, "who had forgotten all about so usual an occurrence, returned our umbrellas to us with an obsequiousness capable of but one interpretation." "I shall not give him anything," said Butler severely to Jones. "Oh yes, I will though," then, with a very fair approach to Sicilian politeness, he handed the bad lira back to the old man.

The custode's face changed and changed again like a field of corn on a breezy morning. In spite of his archiepiscopal appearance he would have been contented with a few soldi; seeing a whole lira he beamed with delight; then, detecting its badness, his countenance fell and he began to object; almost immediately he identified it as his own coin and was on the point of bursting with rage, but suddenly realizing he had nothing to say, he laughed heartily, shook hands with both of us, and apologized for not being able to leave his post as he would have so much liked to drink a glass of wine with us.

"There, now we have made another friend for life," said Butler as we drove away. "This comes of doing the right thing. We must really be more careful. It is another illustration of what I am so constantly telling you; this is the sort of thing that must have been in the Apostle's mind when he said that about all things working together for good to them that love God."

But it fell to the lot of our own country (Montreal in particular) to provide him with the best known incident of his travels. In 1875 he was in Montreal on business (incidentally he has a charming passage on the beauty of Mount Royal and how the sound of the Notre Dame bells rising up to him from the city began a train of thought expressed in *Life and Habit*), and one day he went into the Museum of Natural History:

I came upon two plaster casts, one of the Antinous and the other of the Discobolus—not the good one, but in my poem, of course, I intend the good one—banished from public view to a room where all manner of skins, plants, snakes, etc., and, in the middle of these, an old man stuffing an owl.*

"Ah!" said I, "so you have some antiques here; why don't you put them where people can see them?"

"Well, Sir," answered the custodian, "you see they are rather vulgar."

He then talked a good deal, and said his brother did all Mr. Spurgeon's printing. The dialogue—perhaps true, perhaps imaginary, perhaps a little of the one and a little of the other—between the writer and this old man gave rise to the lines that follow (*The Psalm of Montreal*).

Most regretfully, we have no space to reproduce the *Psalm*, but one or two verses may be recalled.

Stowed away in a Montreal lumber room
The Discobolus standeth and turneth his face to the wall;
Dusty, cobweb-covered, maimed and set at naught,
Beauty crieth in an attic and no man regardeth;
O God! O Montreal!

And I turned to the man of skins and said unto him
"O thou man of skins,
Wherefore hast thou done thus to shame the beauty of
the Discobolus?"
But the Lord had hardened the heart of the man of skins,
And he answered, "My brother is haberdasher to Mr. Spurgeon."
O God! O Montreal!

"The Discobolus is put here because he is vulgar,
He has neither vest nor pants with which to cover his
limbs,
I, Sir, am a person of most respectable connections—
My brother-in-law is haberdasher to Mr. Spurgeon."
O God! O Montreal!

Then I said, "O brother-in-law to Mr. Spurgeon's
haberdasher,
Who seasonest also the skins of Canadian owls,
Thou callest trousers 'pants' whereas I call them
'trousers',
Therefore, thou art in hell-fire and may the Lord pity
thee!"
O God! O Montreal!

Three people live in the shadow of Butler:
Miss Savage, Mr. H. F. Jones, his friend and
biographer, and Alfred Cathie, his clerk, valet,
and everything else, including friend (he is still

* His name was Passmore. In the Osler Library at McGill there is a copy of the *Psalm* made by Revere Osler, on the back of which Sir William wrote: "I knew old Passmore well and the room with the Discobolus. Quaint old Cornishman."

living). With Miss Savage, a fellow student at an art school, he carried on a correspondence which it is a sheer pleasure to read. But his treatment of her more than once shows a churlishness which makes one wonder how he could ever have kept any friends at all. In one of his notes he says of her: "There is no bore like a brilliant bore." But at her death his irrepressible remorse made amends. It is perhaps best summed up in the one line: "Death bound me to her when he set me free." Henry Festing Jones, his closest friend, wrote a biography of Butler and has earned our eternal thanks: he was a Boswell entirely worthy of his subject. Of Alfred Cathie we cannot read too much, and fortunately he occupies a large part in the *Life*.

Alfred was almost from the very day he came to me, at once servant and friend. I began to feel almost immediately that I was like a basket that had been entrusted to a dog.

Alfred would write him little notes as reminders to get his hair cut, or buy tickets for the play, etc. One day Butler found the following in his waistcoat pocket:

This is the last notice from Alfred to the effect that S. Butler, Esq'r. is to buy himself a new Hat on Wednesday morning the 8th November, 1893. Failing

to do this there will be an awful scene on his return to Clifford's Inn. ALFRED.

One day Butler received an invitation to visit Dr. Mandell Creighton (later Bishop of London). He was a little doubtful whether to go or not. As usual, he consulted Alfred, who said, "Let me look at his letter, Sir." I gave him the letter and he said, "I see, Sir, there is a crumb of tobacco in it. I think you may go."

One last extract may be made of a note made by Butler on "Alfred at the Opera":

"Oh it was lovely, Sir. And in one scene they brought on a horse richly capronized you know, sir."

I said, "Alfred, spell that word", and made a beginning for him.

"Oh yes," he answered, "I know—comparisoned."

"Come, come, Alfred, you know better than that."

"Well, Sir, it will be six years before I want to use that word, and won't it do if I study it then?"

To which I not altogether unwillingly yielded, for Alfred's education takes time, and, what is more, he is so very good as he is that it is better to leave him alone.

The *Notebooks* from which this is taken show us the most characteristic moods of Butler, his originality, his hatred of sham, his irritability and perversity, his warmth of generosity, and his unforgettable irony; everything that goes to make up a personality very rarely found in any generation, and one to be given high veneration.

Association Notes

THE ANNUAL MEETING, VICTORIA, B.C.

JUNE 22nd to 26th

Speakers for the General Sessions

Dr. Tate Mason, Seattle, Wash.—Greetings from the American Medical Association.

Dr. A. T. Bazin, Montreal.—"Primary tumour of bone" (lantern demonstration).

Dr. E. E. Cleaver, Toronto.—"Results in the medical treatment of gastric ulcer."

Dr. R. R. Graham, Toronto.—"Diverticulitis of the sigmoid colon."

Dr. F. S. Patch, Montreal.—"Tumours of the upper urinary tract."

Dr. Duncan Graham, Toronto.—To be announced.

Dr. E. L. Pope, Edmonton.—"Vascular episodes."

Dr. J. C. Meakins, Montreal.—"Trichiniasis in Canada."

Dr. Beverley C. Leech, Regina.—"The present trend in anaesthesia."

Dr. D. E. H. Cleveland, Vancouver.—"The medical treatment of ringworm of the scalp."

Dr. Gordon Fahrni, Toronto.—"A practical consideration of the mineral and vitamin requirements of man."

Dr. John Gunn, Winnipeg.—"A review of some aspects of the surgery of the sympathetic nervous system."

Dr. Verne Hunt, Los Angeles, Calif.—"Curability of cancer of the stomach."

Sir Frederick Banting, Toronto.—"Silicosis research."

Dr. Charles Best, Toronto.—"Methods of administration of hormones, with special reference to protamine insulin."

Dr. J. B. Collip, Montreal.—"The significance of recent investigations on the ductless glands."

Dr. E. W. Archibald, Montreal.—Lister Oration.

St. Joseph's Hospital, Victoria B.C.

The year 1936 marks the sixtieth anniversary of the founding of St. Joseph's Hospital, the first hospital in British Columbia, and the thirty-sixth anniversary of the opening of St. Joseph's School of Nursing.

St. Joseph's Hospital in its inception was the dream of Bishop Demers, but it was left to his successor, Archbishop Charles J. Seghers, to see this dream realized. The Sisters of Saint Ann who, since 1858, had been conducting a Boarding and Day School in Victoria, frequently extended their works of mercy to the sick.

Recognizing the need for an organized hospital in Victoria, the Sisters acceded to the request of the Hon. Dr. John S. Helmcken, and prepared to undertake the work.

In 1876 St. Joseph's Hospital was opened, affording accommodation for thirty-five patients. In 1888 and 1897 additions to the original Hospital were built. In 1900 the School of Nursing was opened; in 1908 the Humboldt wing was built; and, finally, in 1929, the Surgical and Obstetrical Unit completed the hospital as it stands today with a bed capacity of 260, and the last word in structure and equipment. St. Joseph's Hospital was placed



St. Joseph's Hospital, Victoria, B.C.



The Royal Jubilee Hospital, Victoria, B.C.

in Class "A" by the American College of Surgeons and Physicians in October, 1920.

St. Joseph's is a General Hospital, having Medical, Surgical, Obstetrical, Pædiatric and Contagious Departments. The Annex for the treatment of tuberculous patients or suspects is set in a delightful old-world garden, and was one of the lovely homes of Victoria's early families. The buildings are of grey brick and reinforced concrete. Victoria, a city of sunshine, magnificent scenery and bracing sea-air, affords an ideal location for a hospital. St. Joseph's has the pre-eminent advantage of being within a few minutes' walk of the trains, wharves, and business sections of the city, yet it is practically bordered by the beautiful Beacon Hill Park.

The Royal Jubilee Hospital, Victoria, B.C.

This hospital was built in 1887 as a permanent memorial of the Jubilee of Queen Victoria. In 1925 a new wing was added. The hospital is beautifully situated on twenty acres. It has 390 beds, including a Pavilion of 40 beds for tuberculosis. The Staff and Intern Services are well organized. In this hospital the first training school for nurses in British Columbia was opened in 1891. At present owing to the generosity of an anonymous donor a complete new therapeutic and diagnostic equipment is being installed in the Radiological Department.

Proceedings of the Executive Committee

October 31, 1935

(Continued)

REPORT OF THE STUDY COMMITTEE ON CANCER

Dr. Primrose outlined the business transacted at a meeting of the Study Committee on Cancer held in Toronto on October 28, 1935.

He stated that there were ten members of the Committee who reside in Toronto and ten representing the different Provinces in Canada. The Provincial representatives comprised the Chairman of each Provincial Committee on Cancer. In the Province of Alberta there are two such Provincial Committees and hence two representatives come from Alberta and one from each of the other Provinces.

Various communications have been received from the different provinces containing certain recommendations. These were read to the Executive Committee.

A number of applications for funds have been received, but the Committee could not at the present time consider the expenditure of any money as they have as yet no knowledge regarding the funds that may be available from the King George V. Silver Jubilee Cancer Fund for Canada.

The Committee is very strongly of the opinion that the money available should be devoted to education of the medical profession and the public and should not be used for research. It is considered that the limited amount available in the Jubilee Fund would be of very little assistance in the research field.

Attention was called to the fact that the Jubilee Fund failed to reach the proportions that were confidently expected. An analysis of the contributions received would indicate that while there were many individual subscriptions (320,154), the average subscription per individual was only 74½¢. It is obvious that very few subscriptions were received from wealthy people. The inference is that possibly further sources of revenue may yet be found.

Certain recommendations of the Committee were adopted by the Executive as follows:—
(*Re: King George V. Silver Jubilee Cancer Fund for Canada.*)

"That an intensive educational program, both medical and lay, should be considered as a first obligation of the Jubilee Fund.

"That such an educational program, to be of material value and to cover Canada as a whole, would require the expenditure of money considerably in excess of the annual increment, which would be earned from investment of the capital sum.

"That in the opinion of the Committee, the expenditure annually of a lesser sum than \$40,000 or \$50,000 would not attain the objective which could reasonably be expected from a properly worked out and conducted program.

"The Committee would respectfully submit that, in its opinion, the Canadian Medical Association is qualified and prepared to administer and conduct an educational program, utilizing such portion of the funds as may be entrusted to it by the Board of Trustees."

DR. McEACHERN.—I think it would be well to review our situation. If we go back to the meeting of April, 1935, a resolution was passed in which we reiterated our endorsement of the report of the Study Committee on Cancer to the previous Executive Committee. My recollection was that, along with the educational activities that have been discussed here to-night, it was proposed to create a lay organization which would act in conjunction with the medical profession as a vehicle through which the lay public could have education carried to them and a body which could raise the sinews of war. I do feel that, had we gone on and put that into effect, when the Governor-General announced the establishment of this King George V. Silver Jubilee Cancer Fund for Canada we would have had a lay organization extending from the Atlantic to the Pacific which would be of very great value in collecting a fund which would probably have been at least double what it is today. Of course, that opportunity is passed, but there still remains to us the opportunity of trying to set up that lay organization which can be used to increase the Jubilee Cancer Fund.

We may get from that a small sum of money which will enable us to do a little work and we could then call to the attention of the Trustees of this Jubilee Fund the fact that we could do more if we had the funds.

DR. YOUNG.—In looking over the past, we will all realize that the establishment of this scheme for raising the King George V. Silver Jubilee Cancer Fund for Canada was so new that it rather scrapped the existing plans of our Study Committee on Cancer, and yet that probably is a temporary affair. I think the organization we suggested will yet come into existence and at the same time there should be that opportunity for the Canadian Medical Association to take part in the formation of such a lay organization as Dr. McEachern suggests. In fact it is the only way the fund could be implemented from time to time.

DR. PRIMROSE.—The first thing was that the Executive Committee approved of the formation of an organization somewhat similar to the British Empire Cancer Campaign. Then we decided to use the Canadian Medical Association so far as its different departments would go. Then the cancer campaign came on, and we went no further with our plan. Now we have brought in this report in view of the funds that are now available.

DR. MEAKINS.—Does that infer that the Canadian Medical Association think themselves equipped to carry out a program of education of the medical profession? Will there be other organizations engaged in the educational campaign, one for the laity and the Canadian Medical Association for the medical profession? I would like to reaffirm my faith in our original scheme in which the Canadian Medical Association took a very important part. The matter was held up because we had not funds. Now we have an opportunity to secure funds and we suggest spending the money without any reference to the establishment of an organization such as we then had in mind.

DR. MCEACHERN.—In the report of the Canadian Medical Association Committee on Cancer as submitted at the Atlantic City meeting, this clause appears: "Moved by Dr. Meakins, seconded by Dr. Fitzgerald, that the resolution passed by the Executive Committee on October 30th, be still considered the confession of faith of the Canadian Medical Association."

THE GENERAL SECRETARY.—Supposing Dr. Primrose goes to the Board of Trustees and explains the views of this long discussion and the Trustees say that, in their judgment, they do not consider it wise to distribute the capital at this time but will give \$10,000 a year to the Canadian Medical Association for their program, we would then be at liberty to develop the program we formerly had in mind. In going to

the Trustees, Dr. Primrose is not placing himself in an untenable position, but merely stating what this Association is qualified to do.

Dr. Patch here reads the following from the report of the Atlantic City meeting:

"It was the feeling of those present that any recommendations which should be made to the Board of Trustees with regard to the cooperation of the Canadian Medical Association in the fight against cancer, should be left to the discretion of Dr. Primrose who is fully aware of our ability to perform such services as may be entrusted to us."

REPORT OF THE DEPARTMENT OF HOSPITAL SERVICE

Owing to the lateness of the hour, Dr. Agnew curtailed his report very considerably.

1. *Group Hospitalization Report.*—Dr. Agnew stated that the report of the Committee on Group Hospitalization which has been printed and distributed quite extensively has met with considerable approval, and the American Hospital Association has endorsed it and expressed a desire to have reprints made to send to every hospital in the United States.

2. *Re Basis of Approval for Internship.*—Dr. Agnew stated that the basis of approval for internship does not contain any clause which would define the preliminary education of interns accepted by approved hospitals. The tendency of our graduates to go south has been replaced by a tendency in the other direction. We are receiving an increasing number of applications from American graduates for Canadian internships. It has been pointed out to me by Dr. Wm. D. Cutter, of the American Medical Association, that there are a few interns in United States hospitals at the present time who are not graduates of approved medical schools. The Committee on Approval of the American Medical Association has expressed agreement with the suggestion that we revise our basis of approval so that hospitals on the approved list would be asked to limit their list of interns to graduates and undergraduates of schools that are approved by the basis used on this Continent.

It was moved by Dr. Meakins, seconded by Dr. Bazin, and carried.

That the Department of Hospital Service be empowered to act in this matter as suggested, and that they also write to all approved hospitals on our list, notifying them of the necessary qualification for interns.

3. *Meeting of Hospital Council.*—Dr. Agnew then reported briefly on the meeting of the Canadian Hospital Council held in Ottawa on October 8, 9, and 10. The different hospital associations in Canada are now contributing something towards the upkeep of the Canadian Hospital Council and the salary of one girl is being charged to the income from this source. The account for printing in connection with the

meeting of the Hospital Council two years ago was \$1,200. Dr. Agnew stated that he felt that this year one-half of the account could be borne by the Hospital Council. Dr. Agnew asked for authority to charge a portion of the expense for printing to the Department of Hospital Service this year, such portion not to exceed \$600. As the Council meetings are held only every two years, this amount might be spread over this year and next. This was agreed to.

COMMITTEE ON ORATIONS

It was decided to invite Dr. E. W. Archibald, of Montreal, to give the Lister Oration at Victoria, B.C., next June.

Other routine business was transacted and the Committee adjourned at 12.45 a.m.

CONSTITUTION AND BY-LAWS

APPLICABLE TO DIVISIONS

CONSTITUTION

ARTICLE I.—TITLE

This Association shall be known as The Canadian Medical Association, and, when the French language is used, it shall be known as "L'Association Médicale Canadienne".

ARTICLE II.—OBJECTS

1. The promotion of health and the prevention of disease.
2. The improvement of medical services however rendered.
3. The maintenance of the integrity and honour of the medical profession.
4. The performance of such other lawful things as are incidental or conducive to the welfare of the public and of the medical and allied professions.

ARTICLE III.—ETHICS

The Code of Ethics of The Association shall be such as may be adopted by The Association from time to time. A copy shall be supplied to all members of The Association.

ARTICLE IV.—MEMBERSHIP

The Association shall be composed of ordinary members, members-at-large, senior, non-resident and honorary members, elected by the method set forth in the By-Laws.

ARTICLE V.—BRANCH ASSOCIATIONS

Each provincial medical association is recognized as a Branch Association, and shall be represented on the General Council and on the Executive Committee of The Canadian Medical Association.

Any Branch, if it so desires, may merge its identity in that of The Canadian Medical Association and become a Division. It shall then be known as The Canadian Medical Association, (name of Province) Division. All of its members shall be members of The Canadian Medical Association and shall be entitled to all the rights and privileges of membership.

ARTICLE VI.—AFFILIATED SOCIETIES

Any nationally or internationally organized medical, scientific or sociological body may, subject to the approval of the General Council, become affiliated with The Canadian Medical Association.

Affiliation shall be understood to imply the establishment of a friendly relationship with the affiliated organization. There shall be no obligation on the part of either party to the affiliation to sponsor policies or movements on the part of the other.

ARTICLE VII.—MEETINGS

The meetings of The Association shall be held in whole or in part on such occasions as may be provided for in the By-Laws.

ARTICLE VIII.—OFFICERS

(a) The Patron.

(b) The elective officers of The Association shall be a President, a President-Elect, a Chairman of the General Council, and an Honorary-Treasurer.

(c) The appointive officers of The Association shall be a General Secretary and such other officers as may be appointed by the Executive Committee.

ARTICLE IX.—THE GENERAL COUNCIL

In so far as it relates to Divisions, the General Council shall consist of:—

- (a) The officers of The Association.
- (b) The President and Secretary or Joint Secretaries of Divisions.
- (c) Delegates elected by Divisions.
Each Division shall be entitled to elect 5 delegates to serve on the General Council for its membership in The Canadian Medical Association of 50 or less; 1 additional delegate for its membership from 51 to 100; another delegate for its membership from 101 to 300; and, thereafter, one delegate for every 300 members above 300.
- (d) Chairmen and Secretaries of Committees of The Association.
- (e) Chairmen and Secretaries of Sections of The Association.
- (f) Past-Presidents of The Association.
- (g) Two representatives of the Department of Pensions and National Health.

ARTICLE X.—COMMITTEES

The Committees shall be (a) Standing; (b) Special.

(a) The Executive Committee shall be elected by the General Council; the other Standing Committees shall be appointed by the Executive Committee.

The Standing Committees are as follows:—

1. The Executive Committee
2. The Committee on Legislation
3. The Committee on Medical Education
4. The Post-Graduate Committee
5. The Central Committee on Program.
6. The Committee on Constitution and By-Laws
7. The Committee on Archives
8. The Committee on Public Health
9. The Committee on Ethics and Credentials
10. The Committee on Economics
11. The Committee on Pharmacy
12. The Committee on Hospital Service
13. The Cancer Committee.

- (b) Special Committees may be appointed by—
- (i) the President
 - (ii) the General Council
 - (iii) the Executive Committee
 - (iv) the Chairman of the General Council.

ARTICLE XI.—FUNDS

Funds for the purpose of The Association shall be raised in such manner as may be determined by the General Council.

ARTICLE XII.—THE ASSOCIATION YEAR

The Association year shall be the calendar year.

ARTICLE XIII.—AMENDMENTS

1. Notice of Motion by individual members or others to amend the Constitution must be placed in the hands of the General Secretary six months before the date of the annual meeting.

2. Amendments may be proposed by the General Council, the Executive Committee or the Committee on Constitution and By-Laws, without notice of motion, but the proposed amendments shall be published in the *Journal* in two issues preceding the annual meeting.

3. The Constitution shall be amended by a two-thirds vote of the members of the General Council in session present and voting.

ARTICLE XIV.

No provision of the Constitution or By-Laws herein set forth shall interfere with the status of a Division as a provincial organization. As a provincial body, it shall have complete control of its own affairs.

BY-LAWS

CHAPTER I.—MEMBERSHIP

Section 1—Ordinary Members

Every member in good standing in a Division shall be an *ordinary member* of The Canadian Medical Association.

Section 2—Members-at-Large

Any graduate in medicine residing in any province of Canada, who is not a member of a Division, shall be accepted as a member of The Canadian Medical Association on written approval presented to the General Secretary from the Executive body of the Division in the province in which he (she) resides. He (she) shall be liable for the annual fee. Such members shall be designated *Members-at-Large*.

Section 3—Senior Members

Any member of The Association in good standing who has attained the age of seventy years is eligible to be nominated for senior membership by any ordinary member of The Association, but may be elected only by the unanimous approval of the members of the General Council in session present and voting. Not more than ten such senior members may be elected in any one year. Senior members shall enjoy all the rights and privileges of The Association, but shall not be required to pay any annual fee.

Section 4—Non-Resident Members

Non-resident members may be elected by the Executive Committee from regularly qualified practitioners residing outside of Canada. They shall be required to pay not more than seventy-five per cent of the annual fee.

Section 5—Honorary Members

Honorary members may be nominated by any member of The Association and shall be elected only by unanimous vote of the General Council in session present and voting. Not more than five honorary members may be elected in any one year and at no time shall the list of living honorary members exceed twenty-five. Honorary members shall enjoy all the rights and privileges of The Association, but shall not be required to pay an annual fee.

Section 6—Discipline of Members

Any member failing to conform to the Constitution and By-Laws and Code of Ethics shall be liable to censure, suspension or expulsion.

(a) Any member whose annual fee is directly payable to The Canadian Medical Association and whose annual fee has not been paid on or before the 31st of March of the current year, may, without prejudice to his (her) liability to The Association, be suspended from all privileges of membership.

(b) Any member who has been found guilty of unprofessional conduct may, upon representation of the facts to the General Council, be censured, suspended or expelled from The Canadian Medical Association.

Section 7—Restoration to Membership

A member, suspended or expelled, shall not be restored to membership until all arrears of fees (if directly payable to The Canadian Medical Association) have been paid, or until such requirements as may be determined by the General Council or the Executive Committee have been met.

Section 8—Resignation from Membership

Membership in The Association shall automatically cease only on suspension, expulsion or death. Resignation may be effected by giving notice in writing to the Secretary of the Division not less than one month before the beginning of the calendar year; or in the case of a member-at-large, by giving notice directly to the General Secretary of The Canadian Medical Association one month before the next annual fee is due.

Section 9—Registration at Meetings

No member shall take part in the proceedings of The Association or in the proceedings of any of the sections thereof until he (she) has properly registered.

CHAPTER II.—GUESTS AND VISITORS

Section 1—Visitors from outside of Canada

Medical practitioners and other men of science residing outside of Canada may attend the Annual Meeting as guests of the President or of the General Council, or as visitors when vouched for by the General Secretary. They shall register with the General Secretary without payment of fee and may, after proper introduction, be allowed to participate in discussions.

Section 2—Medical Students attending Meetings

Any hospital intern or medical student, when properly vouched for, may be admitted as a visitor to the scientific meetings, but shall not be allowed to take part in any of the proceedings unless specially invited by the Committee on Program to present a communication.

Section 3—Delegates from Affiliated Societies at Scientific Meetings

Two delegates from each affiliated society, one of whom shall be a member of this Association, may attend the scientific meetings.

Section 4—Delegates from Affiliated Societies at Meetings of General Council

Two delegates from each affiliated society, provided one delegate is a member of this Association, may be invited by the Executive Committee to attend meetings of the General Council. They may, at the request of the Chairman, take part in the deliberations but shall have no voting power.

CHAPTER III.—ANNUAL MEETINGS

Section 1—Time and Place of Meetings

The time and place of meetings shall be decided by the General Council, and shall be announced as early as possible.

Section 2—Arrangements for Annual Meetings

When The Canadian Medical Association meets in any province where there is a Division, the meeting shall be held in conjunction with that of the Division. The local arrangements shall be under the direction of the Executive Committee of The Canadian Medical Association, which may enlist the assistance of the Division. The Canadian Medical Association assumes full control of the proceedings of the meeting and of all financial obligations, save entertainment.

Section 3—Type of Program

The program of the meeting may consist of business sessions, general, and sectional scientific sessions.

Section 4—Presiding Officer

The President or some person designated by him shall preside at all general meetings.

Section 5—Rules of Order

The Rules of Order which govern the proceedings of the House of Commons of Canada shall be the guide for conducting all meetings of The Association.

CHAPTER IV.—MEETINGS OF SECTIONS

Section 1—Sectional Scientific Sessions

The Executive Committee shall determine what scientific sections shall hold sessions at any annual meeting.

Section 2—Appointment of Sectional Officers

The Chairman and Secretary for each scientific section shall be appointed by the Executive Committee.

Section 3—Presiding Officers at Meetings of Sections

The Chairman of the Section, or some one designated by him, shall preside at all meetings of the Section.

Section 4—Duties of Secretaries of Sections

The Secretary of the Section shall keep a correct record of the transactions and shall transmit it to the General Secretary for insertion in a Minute Book provided for the purpose.

CHAPTER V.—OFFICERS AND EXECUTIVE COMMITTEE

Section 1—Appointment of Nominating Committee

The General Council, at the first session of the annual meeting, shall elect by ballot from among its members present a Nominating Committee of fifteen members, not including the President, who shall be *ex-officio* Chairman of the Committee.

Candidates for election to the Nominating Committee shall be named from the floor, and the list shall include the names of one or more members of each Branch or Division, if represented at this session; but a Division, through an accredited representative present, may officially place in nomination the name of one candidate.

The candidate in each province holding the highest vote of the candidates from that province shall be declared elected. The remaining members shall be declared elected by majority vote.

The election shall be decided on a single ballot. The Chairman of the General Council shall, if necessary, give the casting vote or votes.

Section 2—Duties of Nominating Committee

The Nominating Committee shall meet on the day of its election and submit to a later session of the General Council:—

1. Nominations of the following officers of The Association: a President-Elect, a Chairman of the General Council, and an Honorary-Treasurer.

2. Nomination of an Executive Committee which, in addition to those who are members *ex-officio* (See Chapter VII., Section 4), shall consist of thirteen members geographically distributed as follows:—Three shall be resident in each of the two provinces in which the offices of The Association are located and one in each of the other provinces.

At its session, the Nominating Committee may receive in writing a Division's official nomination of a candidate or candidates for the representation on the Executive Committee to which the Division is entitled. In the event of this official nomination(s) being rejected, in whole or in part, by the Nominating Committee, the reasons for such action shall be incorporated in the report to General Council.

3. *Rules of Procedure.*—The Committee shall be called to order by the President or *ex-officio* of the Committee. In the absence of the President, the General Secretary shall convene the Committee and request the Committee to select, by open vote, the Chairman. The Committee shall then proceed to carry out the duties of

open vote. In case of a tie vote, the Chairman shall have the casting vote in addition to the vote to which he is entitled as a member of the Committee. When called for, the report of the Committee shall be presented to the General Council by the General Secretary.

Section 3—Election of Officers and Executive Committee and Place of Meeting.

When the report of the Nominating Committee has been received by the General Council in session other nominations may also be received from the floor. A ballot shall then be taken for each of the offices in turn and also for elective members of the Executive Committee, by provinces, in accordance with the By-Law for the guidance of the Nominating Committee, Chapter V., Section 2, paragraph 2.

CHAPTER VI.—DUTIES OF OFFICERS

Section 1—Duties of the President

The President shall preside at the general sessions of The Association and shall perform such duties as custom and parliamentary usage require. He shall deliver a presidential address. He shall be a member *ex-officio* of all committees of The Association. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association.

Section 2—Duties of the President-Elect

The President-Elect shall be installed and shall assume the office of President at the first general session of the annual meeting next following his election to the office of President-Elect. He shall be a member *ex-officio* of all committees of The Association. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association.

Section 3—Duties of the Chairman of the General Council

The Chairman of the General Council shall preside at all meetings of the General Council. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association. He shall be a member *ex-officio* of all Committees and Chairman of the Executive Committee.

Section 4—Duties of the Honorary-Treasurer

The Honorary-Treasurer shall be the custodian of all moneys, securities, and deeds which are the property of The Association.

He shall pay by cheque only. Such cheques shall be countersigned by the Chairman of the General Council or other authorized officer of The Association, and shall be covered by voucher.

He shall prepare an annual financial statement audited by a chartered accountant.

He shall furnish a suitable bond for the faithful discharge of his duties. The cost of the bond shall be borne by The Association.

He may receive for his services an honorarium to be determined by the General Council. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association.

He shall be a member *ex-officio* of the Executive Committee.

Section 5—Duties of the General Secretary

The General Secretary shall be the Secretary also of the General Council and of the Executive Committee of The Association. He shall also be a member *ex-officio* of all Committees of The Association. He shall give due notice of the time and place of all annual and special general meetings, by publishing the same in the official Journal of The Association, or, if necessary by notice to each member. He shall keep the minutes of each meeting of the General Council and the Executive Committee in separate books, and shall provide minute books for the recording of the proposed actions, which he shall require to be properly attended by the secretaries thereof. He shall notify the officers and members of committees of their appointment and of their duties in connection therewith. He shall publish the official reports of

each annual meeting. He shall perform such other duties as may be required of him by the President, the General Council or the Executive Committee. All his legitimate travelling expenses shall be paid for him out of the funds of The Association, and he shall receive for his services a salary to be determined by the Executive Committee.

CHAPTER VII.—THE GENERAL COUNCIL

Section 1—Meetings of the General Council

The General Council shall meet for at least the first two days of the annual meeting of The Association and thereafter while The Association is in session, at the call of the Chairman. Before the close of the annual meeting it shall elect the officers and the Executive Committee and select the place for the next annual meeting, or, if advisable, for meetings up to three years in advance.

Section 2—Special Meetings of General Council

During the interval between annual meetings the General Council shall meet at the call of the Executive Committee. For all such meetings of the General Council, due notice shall be sent to each member, stating the purpose of the meeting. The Executive Committee, if it so decides, instead of calling such meetings of the General Council, may refer important questions to the General Council and obtain its decision by means of a mail ballot. In the event of a mail ballot being taken, a two-thirds majority vote shall govern.

Section 3—Duties of the General Council

The General Council shall have supervision of all properties and of all financial affairs of The Association. It shall, through its officers, conduct all business and correspondence, and shall keep a record of all meetings and the receipt and expenditure of all funds, and shall report upon same in the *Journal* after the annual meeting.

Section 4—The Executive Committee may Act for the General Council

In order that the business of The Association may be facilitated during the interval between annual meetings, the Executive Committee shall meet from time to time at the call of its Chairman and shall have all the rights and powers of the General Council. It shall conduct all necessary business. In case of a vacancy in any office on account of death or otherwise it shall have power to appoint successors.

The President, the President-Elect, the Chairman of the General Council, the Honorary-Treasurer, the General Secretary, the Editor, and the Managing Editor shall be members *ex-officio* of the Executive Committee.

CHAPTER VIII.—COMMITTEES

Section 1—Duties and Powers of the Executive Committee

The Executive Committee shall hold one or more sessions before the close of the annual meeting at which it is elected. At this meeting it shall appoint chairmen of the standing committees for the ensuing year. Between the meetings of the General Council, the Executive Committee shall represent the General Council in all its business affairs and shall exercise all the rights and powers of the General Council. The Executive Committee shall report to the General Council at the annual meeting and at such other times as the Chairman of the General Council may request.

The Executive Committee may meet when and where it may determine. On the request in writing of any three members of the Executive Committee the Chairman shall call a special meeting. Five members, exclusive of the Chairman, shall constitute a quorum for the transaction of business.

The Executive Committee shall be responsible for the appointment of the General Secretary, the Editor, the Managing Editor, the Associate Secretaries, and any other appointive officers, and shall fix their salaries.

The Executive Committee shall have charge of the publication of the official *Journal* of The Association and of all published proceedings, transactions, memoirs, essays, papers and programs of The Association.

The Editor and Managing Editor shall present annual reports to the General Council and interim reports at each meeting of the Executive Committee. The Editor shall be reimbursed for his legitimate travelling expenses incurred on Association business.

The Executive Committee may appoint Editorial Boards to assist the Editors.

The Executive Committee shall appoint the auditor and shall have the accounts of the Honorary-Treasurer audited annually, or more often if desirable, and shall make an annual report on the same to the General Council.

Each member of the Executive Committee shall be reimbursed for his legitimate travelling expenses incurred in attending meetings of the Executive Committee other than the first meeting or meetings of the new Executive Committee, which may be held before the close of the annual meeting.

Section 2—Committee on Legislation

All matters relating to medical legislation, Federal or Provincial, and all matters requiring legislative action (made or contemplated) arising within The Association, or any of its branches, or any of its committees, shall be referred to the Committee on Legislation for information and for any necessary action.

Section 3—Committee on Medical Education

To the Committee on Medical Education shall be referred all matters pertaining to medical colleges and medical education. It shall report upon the condition of medical education throughout Canada and upon any proposed change and may suggest methods for the improvement of medical education.

Section 4—Post-Graduate Committee

To the Post-Graduate Committee shall be delegated by the Executive Committee, the responsibility of carrying out the post-graduate plans of The Association.

Section 5—Committee on Program

This Committee, with the assistance of the Chairman and Secretary of each scientific section, shall have complete charge of the preparation of the program for the annual meeting.

Section 6—Committee on Constitution and By-Laws

To the Committee on Constitution and By-Laws shall be referred all matters relating to the subject before action thereon is taken by the General Council.

Section 7—Committee on Archives

The Committee on Archives shall be responsible for collecting as far as possible, (a) the obituaries of members dying since the last annual meeting; (b) all documents and information relating to the various members and activities of The Canadian Medical Association which are deemed worthy of preservation. The Editor of the *Journal* shall be a member *ex-officio* of this Committee.

Section 8—Committee on Public Health

(a) It shall be the duty of this Committee to place itself in communication with the official and voluntary health organizations of the Dominion.

(b) It shall be the duty of this Committee to keep the public informed through the various means available, on matters pertaining to health.

Section 9—Committee on Ethics and Credentials

To this Committee all matters of ethics and special questions of credentials shall be referred for consideration and report to the General Council or the Executive Committee.

Section 10—Committee on Economics

It shall be the duty of the Committee on Economics (excepting where otherwise provided) to deal with (a) social legislation which includes medical services or benefits presumably for medical services; (b) remuneration and employment of physicians by lay bodies, hospital or official bodies, including Federal, Provincial and Municipal Governments.

Section 11—Committee on Pharmacy

It shall be the duty of the Committee on Pharmacy to deal with (a) all matters arising out of the British Pharmacopoeia or any Canadian Formulary or Pharmacopoeia; (b) all matters arising out of the drug section of the Food and Drugs Act, the Narcotic Act, or the Patent and Proprietary Medicine Act, and (c) any inquiries from members of The Association relating to the use or standards of drugs.

Section 12—Hospital Service Committee

This Committee shall act in an advisory capacity to the Hospital Service Department of The Association.

Section 13—Committee on Cancer

To this Committee shall be referred all matters relating to the study and control of cancer.

Section 14—Special Committees

Each Special Committee shall assume, by direction, such duties as are allotted to it, and shall make progress reports to the Executive Committee at each of the meetings of that body or at any other time that such reports may be required by the President, the Chairman of the General Council, or the Executive Committee.

Section 15—Reports of Committees

Reports of all Committees shall be printed and mailed to all members of the General Council at least one week before the annual meeting.

Section 16—Limitations of Committees re Finances

No Committee shall expend any moneys or incur any indebtedness or obligation on behalf of The Association without the sanction of the Executive Committee.

CHAPTER IX.—ADDRESSES AND PAPERS

Section 1—Addresses at Annual Meeting

All addresses delivered at an annual meeting shall immediately become the property of The Association, to be published or not, in whole or in part, as deemed advisable, in the *Journal* of The Association. Any other arrangements for their publication must have the consent of the author or of the reader of the same and of the Editor of the *Journal*.

Section 2—Publication of Papers Presented at Annual Meeting

All papers, essays, photographs, diagrams, etc., presented in any section, shall become the property of The Association, to be published in the *Journal* of The Association or not, as determined by the Editor, and they shall not be otherwise published except with the consent of the author and of the Editor of the *Journal*.

Section 3—Disposition of Papers Presented at Annual Meeting

Each author of a paper read before any section shall, as soon as it has been read, hand it with any accompanying diagrams, photographs, etc., to the Secretary of the Section before which it has been presented. The Secretary shall endorse thereon the fact that it has been read in that Section, and shall then transmit it to the Editor of the *Journal*.

CHAPTER X.—PROVISIONS FOR DISCIPLINE

Section 1—If any member of The Association, after due enquiry by the General Council or one of its Standing or Special Committees shall be judged by the General Council to have been guilty of disgraceful conduct in any professional respect, he (she) shall be liable to censure, or suspension, or expulsion from membership in The Association by resolution of the Executive Committee, confirmed by a three-fourths vote at the next ensuing annual meeting of General Council.

Section 2—Should any member of The Association be convicted of any criminal offence, or have his (her) name removed from the register of the Medical Council of Canada, or of the licensing body of any Province of Canada, because of felonious or criminal act or disgraceful

conduct in any professional respect, the Executive Committee may, by resolution, confirmed at the next ensuing annual meeting of the General Council, by a three-fourths vote of those present, censure, or suspend, or expel such member from Membership in The Association.

Section 3—Any member suspended or expelled by resolution, as aforesaid, shall thereby forfeit all his (her) rights and privileges as a member of this Association.

Section 4—Any member suspended or expelled by resolution as aforesaid, shall, subject to conditions imposed by the Executive Committee, be restored to membership upon resolution of the Executive Committee, confirmed at the next ensuing annual meeting of General Council.

Section 5—By subscribing to the application for membership under the terms of the By-Laws and Code of Ethics and becoming a member of The Association, every member attorns to these By-Laws and agrees to such right of discipline as aforesaid and thereby specifically waives any right or claim to damages in the event of his (her) being so disciplined.

CHAPTER XI.—AMENDMENTS

1. Notice of Motion, by individual members or others, to amend the By-Laws, must be placed in the hands of the General Secretary three months before the date of the annual meeting.

2. Amendments may be proposed by the General Council, the Executive Committee or the Committee on Constitution and By-Laws without notice of motion, but the proposed amendments shall be published in the *Journal* in two issues preceding the annual meeting.

3. The By-Laws shall be amended by a two-thirds vote of the members of the General Council in session present and voting.

NOTE.—Throughout these By-Laws masculine and feminine designations are interchangeable.

The Sub-Executive Committee was authorized to take up with the Provinces all negotiations in connection with Federation, and any matters which the Sub-Executive Committee thinks require attention of the whole Executive Committee are to be referred to the Executive Committee for mail ballot.

CHRYSOTHERAPY OF CHRONIC POLYARTHRITIS.—In treatment by gold compounds A. Mester prefers intramuscular injections of allochrysine, the double thiopropanol sulphonate of gold and sodium. Trying it in twenty-nine cases of chronic polyarthritis he found it effective only in the five cases in which there was evidence of a tuberculous etiology of the morbid joint conditions; these patients had suspicious or certain clinical and certain radiological signs of tuberculosis of the lungs or bronchial glands. The other patients failed completely to react. Two were hypersensitive, so that gold treatment had to be stopped. Control tests of the blood as well as of the urine were found valuable. An absolute as well as a relative eosinophilia was taken as a warning of sensitization, the object of treatment being to bring about the reverse. The only other untoward incidents noted were bleeding from previously quiescent piles and ulceration at the nasal muco-cutaneous margin. —*Acta Med. Scand.*, 1935, v-vi, 469. Abs. in *Brit. M. J.*

Hospital Service Department Notes

HOSPITAL STATISTICS FOR CANADA

Only within the past few years have accurate nation-wide hospital statistics for Canada been available. This has been since the Dominion Bureau of Statistics directed its great organization to the collection and analysis of data from the entire hospital field. The Second Annual Report recently issued is for the year 1933 and covers all hospitals but mental hospitals (separately reviewed) and one other which did not report.

Canada could boast in 1933 of 876 hospitals, of which 606, or 69.2 per cent, were public hospitals; 238, or 27.2 per cent, were private; and 32, or 3.6 per cent, were Dominion hospitals. The first group included 34 tuberculosis sanatoria with 7,280 beds, 36 Red Cross hospitals and 23 homes for incurables with 2,940 beds. The total bed capacity was 58,822, of which 53,544 are in public hospitals, 2,740 in private hospitals, and 2,538 in Dominion hospitals. There was an increase of 4,686 beds in public hospitals over the previous year. The number of hospitals with x-ray departments totalled 486; 229 had clinical laboratories; and 230 had physiotherapy departments. There were 119 out-patient departments.

Two hundred and twenty had approved schools of nursing, with a total of 8,044 nurses in training. Of these approved schools, 184 were in general public hospitals, 11 in women's (only) hospitals, 5 in pædiatric, 1 in orthopædic, 8 in tuberculosis, 5 in isolation, and 5 in private hospitals. Of the 5,643 graduate nurses employed (not specials), 5,097 were on the staffs of public hospitals, 362 in private hospitals, and 184 in Dominion hospitals. The total personnel of all hospitals was 34,802. Of these 709 were salaried physicians, of whom public hospitals employed 531 (including 117 in tuberculosis sanatoria), private hospitals 53, and Dominion hospitals 125. We infer that quite a few of these were employed on a part-time basis only. Some 656 interns were reported.

It is of interest to note that the number of patients under care was 700,284, of whom 69,282 were newborn. Of the total number, 660,632 were in public hospitals, 24,492 in private, and 15,160 in Dominion hospitals. For Canada, this meant 655 hospital patients per 10,000 of population; Prince Edward Island was lowest with 445, and British Columbia highest with 953 per 10,000. The average daily number of patients was 39,231. The average days' stay of patients was 14.6 for general hospitals, 43.3. for pædiatric hospitals, 50.8 for convalescent hospitals, 133.9 for tuberculosis sanatoria, and 256.3 for hospitals for incurables.

All communications intended for the Department of Hospital Service of the Canadian Medical Association, 184 College Street, Toronto.

War veterans averaged 35.3 days' stay when hospitalized. The average length of stay in general hospitals gradually increased according to the size of the hospital, ranging from 10 days in hospitals up to 10 beds to 18.6 days in hospitals over 600 beds. The same picture prevailed with respect to occupancy, this being but 39.4 per cent in hospitals up to 10 beds and reaching 75.0 per cent in hospitals over 600 beds. Out-patient reports were difficult to compile. Of the 119 hospitals reporting such, 62 gave 1,527,385 treatments to 256,969 patients; 29 hospitals reported 77,818 patients without stating the number of treatments and 28 others reported 1,266,268 treatments; but did not record the number of patients treated.

All of the above data are exclusive of the mental institutions.

HOSPITAL INTERNSHIPS FOR THEOLOGICAL STUDENTS

The closer relationships now developed between religious organizations and the field of social welfare have demanded that theological students acquire a much broader knowledge of sociology, psychology and physical and mental pathology than was considered essential in the past. Particularly has it seemed advisable that theological students be given an opportunity for supervised contact with persons in distress, physically or mentally, to supplement their seminary teaching in abnormal psychology and other courses, for it has been found that other courses offer better training in mental hygiene, psychology, child study, vocational directing and sociology than do the seminaries. In their efforts to bridge this gap many of the theological colleges made affiliations for study which were often poorly supervised and which might lead the students later on to set up psychoanalysis and other clinics or to pursue sociological activities for which they were obviously untrained. To meet this need a Council has been developed for the clinical training of theological students, under joint medical and ministerial direction and with headquarters in New York. Organized five years ago, after several years of experimentation, this Council has proved eminently successful. Training centres include five mental hospitals, two general hospitals, a child-guidance clinic and a school for problem children. Last year sixty students, representing ten denominations, were enrolled. Two groups of students are accepted—theological interns who spend one year in residence and student attendants who are in residence for one, two or three periods of three months each, either continuously or during the summer.

The theological interns have an interesting course. They have residence for at least three months in a mental hospital where they study patients, get an understanding of the various

therapy departments, and attend meetings and conferences; residence for at least two months under trained supervision in a general hospital, to gain an insight into the various problems of illness for use later on in parish work; residence for two months in a prison centre, receiving instruction on readjustment of prisoners to society; and service for three months in a child guidance clinic or outpatient clinic. The student attendants do pastoral work with patients, working four or five hours a day on the wards and relating their approach to the patients' problems with that of the medical attendant. Religious services in the hospitals may be assigned to the students and hospital news-sheets; musical and special programs and recreational activities are directed; case studies are made and seminars with the medical staff and social workers are held at frequent intervals. The fear might be entertained that such instruction might lead later to unwarranted presumption in these fields on the part of these students, but actual experience would indicate that such training gives them a more wholesome respect for these subjects, and makes them more appreciative in their pastoral work of the value of expert professional guidance.

Provincial Association Notes

PRELIMINARY PROGRAM

FIFTY-SIXTH ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION

LONDON, MAY 26, 27, 28, 29, 1936

The London Committee in charge of arrangements are anxious to advise the medical profession of Canada, and particularly of Ontario, of the tentative plans for the coming Convention to be held in that city in May of this year.

Some innovations are being introduced into the program this year. The scientific sessions will be held in the forenoons only, on Wednesday and Thursday, the afternoons being reserved for recreation. On Friday the scientific sessions will run all day. The total number of speakers has been considerably reduced, but what has been sacrificed in numbers has been amply made up in quality. The speakers are to be limited to twenty minutes with ten minutes' discussion. On each of the three days a clinic will be held from 12.00 noon to 1.00 p.m. These clinics will be conducted by Dr. A. H. Gordon, of Montreal, Dr. Roscoe Graham, of Toronto, and Dr. Foster Kennedy, of New York City.

On Thursday afternoon there is to be a golf tournament, with cups and prizes galore. This tournament will be held at the London Hunt and Country Club, the home club of London's

well known golfers, Sandy Sommerville and Jack Nash. A cup will be donated by the Hamilton Academy of Medicine for the best net score, as well as the new cup donated by the London Academy of Medicine to be played for by teams of four, representing County or City societies. Be sure your Medical Society sends a representative team to compete for this cup. We already have entries from several County Societies. In addition there will be many other prizes for both 18 and 9 hole scores.

Thursday evening after the golf tournament there will be a stag dinner at the Hotel, where the prizes, cups, etc., will be distributed. We are making every effort to obtain a well known humorist for a short snappy speech on that occasion. There will also be various other indoor activities, which will be of interest to everyone; so, plan to be present.

Every effort is being made to secure the best possible speakers for the noon luncheons, and in this respect we feel we have succeeded admirably. For the Wednesday luncheon we will have as our guest, His Excellency, Lord Tweedsmuir. For Thursday we expect to have one of the leading educationists of Canada. For the dinner dance on Wednesday evening we are to be favoured by the presence of the Right Honourable R. B. Bennett.

Another innovation at this Convention will be the display of Scientific Exhibits. This portion of the program has not received much attention heretofore, but we assure you that this year we are to have an exceptionally fine group of scientific exhibits. We are already wondering where we are going to put them all.

While most of the meetings are to be general sessions, there are to be two meetings of specialists. The Eye, Ear, Nose and Throat men, and the Roentgenologists will both have a special meeting on Thursday morning.

The general plan of the program is as follows:

HEADQUARTERS—HOTEL LONDON

Tuesday, May 26, 1936

- 9.00 a.m.—Meeting of Board of Directors.
- 10.00 a.m.—Meeting of Council.
- 1.00 p.m.—Luncheon.
- 2.30 p.m.—Meeting of Council.
- 6.00 p.m.—Meeting of Nominating Committee.
- 7.15 p.m.—Round Table Dinner. Program in charge of Committee on Inter-Relations.

Wednesday, May 27, 1936

- 9.00-9.20—Dr. H. Foucar, London—"Hare-lip and its treatment". (Lantern slides.)
- 9.30-9.50—Dr. R. Farquharson, Toronto—"Pituitary syndromes".
- 10.00-10.20—Dr. F. Lahey, Boston, Mass.—"Diagnosis and management of carcinoma of the colon".

Wednesday, May 27th—Continued

- 10.30–10.50—Dr. D. Crombie, Queen Alexandra Sanatorium, Byron, Ont.—(Subject to be announced later.)
- 11.00–11.20—Intermission for viewing scientific exhibits.
- 11.30–11.50—Dr. G. S. Williamson, Ottawa—“Cutaneous and untoward visceral reactions to some common drugs”.
- 12.00–1.00—Dr. A. H. Gordon—“Medical clinic with presentation of cases”.
- 1.30—Luncheon.
- Guest—His Excellency Lord Tweedsmuir.
- 2.30 p.m.—Business meeting of the Association.
- 4.30—Garden Party.
- 7.00—Dinner Dance.
- Guest—Right Hon. R. B. Bennett.

Thursday, May 28, 1936

- 9.00–9.20—Dr. E. A. Bartram, London — “Edema and its management”.
- 9.30–9.50—Dr. D. W. Boucher, Kingston—“Abdominal and pelvic surgery of the sympathetic nervous system”.
- 10.00–10.20—Dr. H. B. Cushing, Montreal—“Scarlet fever—course, prevention and treatment”.
- 10.30–10.50—Dr. K. McKenzie, Toronto—“Neurological diagnosis with presentation of cases”.
- 11.00–11.20—Intermission for viewing scientific exhibits.
- 11.30–11.50—Dr. E. P. Joslin, Boston, Mass.—(Some phase of diabetes—exact subject to be announced later).
- 12.00–1.00—Dr. Foster Kennedy, New York—“Neurological clinic”.
- 1.30—Luncheon—(Speaker to be announced later).
- 2.30—Golf Tournament at London Hunt and Country Club.
- 7.00—Stag Dinner—Humorist speaker and presentation of golf trophies and prizes, and various other indoor activities.

Friday, May 29, 1936

- 9.00–9.20—Dr. E. V. Shute, London—“Metrorrhagia and its treatment”.
- 9.30–9.50—Dr. E. C. Janes, Hamilton—“Ischio-rectal fistula”.
- 10.00–10.20—Dr. G. B. Eustermann, Rochester, Minn.—“The rôle of gastritis in American medical practice”, (illustrated by lantern slides).
- 10.30–10.50—Dr. John Fraser, Montreal—(Obstetrical problem—exact title to be announced later).

Friday, May 29th—Continued

- 11.00–11.20—Intermission for viewing scientific exhibits.
- 11.30–11.50—Dr. L. G. Rowntree, Philadelphia — “The rôle of the thymus and pineal glands in growth and development”.
- 12.00–1.00—Dr. Roscoe Graham, Toronto—“Surgical clinic”.
- 1.30—Luncheon—(Speaker to be announced later).
- 2.30–2.50—Dr. L. F. Craver, New York — “Some aspects of modern cancer therapy”.
- 3.00–3.20—Speaker on obstetrical subject.
- 3.30–3.50—Drs. W. J. Deadman and H. A. Ansley, Hamilton—“Investigation of the cause of stillbirths and fetal death”.
- 4.00–4.30—Dr. Douglas Wigle, Windsor—“The treatment of head injuries”.
- 6.00—Class Dinners.

Sectional Meetings**Thursday, May 28, 1936****Röntgenology**

There will be a meeting of this section on Thursday forenoon, which will consist of a clinic, demonstration, and scientific papers. The exact program is not yet completed.

Eye, Ear, Nose and Throat

This meeting will also be on Thursday morning. Speakers who have already indicated their willingness to take part in the program are: Dr. S. Hanford McKee, Montreal, Que.; Dr. J. Milton Robb, Detroit, Mich.; Dr. W. J. Brown, London, Ont.; Dr. Perry Goldsmith, Toronto, Ont.

See *The Journal* next month for further details regarding both of the above meetings.

H. A. CAVE,

Convener of Program Committee.

TACT.—The man of tact, as he journeys through life, seldom gives or takes offence, and so avoids many of the mistakes which a brother, less gifted with this quality, is apt to make. He wins the confidence of those with whom he is associated, appearing to follow, where in reality he leads, and thus, unconsciously to them, influences their thoughts and actions. If the tactful person exercises his influence in a right direction, he passes happily through life, and also brightens the pathway of others.

Medical Societies

The Academy of Medicine, Toronto

The Academy of Medicine, Toronto, has been honoured by many distinguished speakers at its special and stated meetings during the present session. Besides Prof. John Beattie and Prof. W. E. Gallie, who were present in November (see this *Journal*, 1935, 33: 688). We note that on December 3rd, Dr. Howard C. Moloy, of New York, was the guest of the Academy for the December stated meeting. The subject of his lecture was "The variations in the female pelvis from the anthropological and obstetrical viewpoint".

For the stated meeting in February, the Academy welcomed Dr. A. H. Gordon, of Montreal, and was favoured with a very instructive address on "Bone changes in certain medical diseases".

From Philadelphia, Dr. Alexander Randall visited the Academy on March 3rd and addressed the stated meeting for this month, illustrating his address, which was entitled "Obstructive uropathies", with many lantern slides.

For the April stated meeting which will be held on the 7th, the Academy is looking forward to an address on "Recent advances in the study of sex hormones" by Dr. G. F. Marrian, Associate Professor of Biochemistry, University of Toronto.

The Academy has indeed been fortunate in hearing such a group of distinguished speakers during the session, 1935-1936.

GORDON S. FOULDS,
Honorary Secretary.

Montreal Physiological Society

At a meeting of the Montreal Physiological Society, held on January 27, 1936, the following papers were read (given here in abstract).

C. O. HEBB, G. O. LANGSTROTH, D. R. McRAE AND G. W. STAVRAKY, Departments of Physiology and Physics, McGill University—Physical and Physiological Studies of Salivary Secretion.

An account was given of the changes in the composition of the submaxillary saliva of the cat in response to stimulation of the sympathetic and parasympathetic nerves and to adrenalin stimulation. Spectrographic methods were used for the quantitative analysis of Na and K, standard chemical methods being employed for the analysis of all the other constituents. (The characteristic feature of the absorption spectrum is the presence of the so-called protein band at λ 2750.) Provisional estimates of the relative concentration of the absorbing substance under different conditions of secretion were made.

The following regularities were observed for secretions obtained by electrical stimulation of the chorda tympani.—The K concentration appears to be independent of the rate of secretion, but the Na concentration is very nearly proportional to it. The dependence of organic matter and absorbing substance concentrations appears to be similar to that of Na, with an additional superimposed "exhaustion" effect. The relative concentrations of the latter substances are quite well represented by an expression deduced from simple fundamental considerations.

With repeated identical stimulations of the chorda tympani the solids, organic material, ash, Na, Ca, Cl and N_2 gradually decreased, while the K and the acid-combining power remained constant or gradually increased. Sugar was absent from the saliva.

On stimulation of the sympathetic nerve all the analyzed constituents showed a tendency to increase in amount, but sugar was absent. On adrenalin administration a greater rise in many of the analyzed constituents occurred, and sugar appeared in the saliva in amounts varying from 40 to 120 mg. per cent.

If the stimulations of the chorda tympani were resumed after the administration of adrenalin it was found that the volume of the secretion was decreased by 30 to 60 per cent, but returned to normal after 1½ to 2 hours. The amount of K and the acid-combining power fell to the level at which they were before the adrenalin administration and maintained this level or gradually rose with successive stimulations. Cl, Na and sugar remained as high as in the adrenaline saliva, or reached a higher level, decreasing towards the end of the experiment. The rise of total N_2 was also quite marked, this being true both in the protein and non-protein fractions of the saliva.

F. K. OLDHAM, Department of Pharmacology, McGill University—The Action of Preparations from the Posterior Lobe of the Pituitary Gland upon the Imbibition of Water by Frogs.

During the past fifteen years several investigators have shown that extracts from the posterior lobe of the pituitary gland give rise to temporary increases in weight when injected into frogs. There has been however considerable difference of opinion as to which of the active principles, the oxytocic, pressor or melanophore, is responsible for the action. This investigation was undertaken to determine whether one (or more) of the known constituents or a hitherto unknown one was involved.

The preparations used were pitocin, pitressin and pituitrin, the Parke, Davis preparations of the oxytocic and pressor fractions and of the whole lobe, respectively. In addition two other preparations, postlobin-O and postlobin-V were used. These were the oxytocic and pressor frac-

tions obtained in the laboratory by an original method of separation. It was thought that if the results obtained from these and from the corresponding commercial preparations agreed the existence of a hypothetic substance could be considered unlikely, unless it was distributed in exactly the same proportions by two totally different methods of separation. Finally, a very strong melanophore dilating substance with very little oxytocic or pressor activity was used.

Two types of experiments were performed. In one the preparations to be studied were injected with 0.5 mls. of saline and the loss in weight was studied. In the other, the preparations were injected with 5.0 mls. of saline and the loss of weight was studied. A large number of frogs were used for each experiment and the weights at half-hour intervals were added together and expressed as per cent increase or decrease of the original weight. From these results graphs could be drawn, the abscissæ representing the change in weight in per cent, and the ordinates, the time in hours. Both types of experiments showed that the oxytocic and pressor fractions both gave rise to weight increases, the former being about four times as effective as the latter. Pituitrin was as effective as the oxytocic preparations, while the melanophore dilating substance was without effect.

J. S. L. BROWNE

At a meeting of the Montreal Physiological Society, held on February 17, 1936, the following papers were read (given here in abstract).

J. B. COLLIP AND J. E. WILLIAMSON, Department of Biochemistry, McGill University—A Modification of the Effect of Pituitary Gonado-

tropic Hormone by Varying Modes of Injection.

It is well known that the intraperitoneal injection of anterior pituitary extracts containing the gonadotropic principle is less effective than subcutaneous administration. Leonard* *et al.* have recently shown that the antagonistic action between certain anterior lobe extracts and the gonadotropic principle of pregnancy urine is elicited best if the antagonist is injected intraperitoneally and the gonadotropic extract subcutaneously. The experiments which we have to report show quite conclusively that intraperitoneal injection is much inferior to subcutaneous injection. They also demonstrate very clearly that intraperitoneal injection coincident with subcutaneous injection of a potent gonadotropic extract results in a marked suppression of the gonadotropic response which subcutaneous injection alone produces.

S. A. KOMAROV — Protein and Non-protein Nitrogen in Canine Gastric Juice.

Various methods for obtaining protein-free filtrates from pure canine gastric juice were studied. The following are regarded as reliable for routine work.

(1) Precipitation by 2 volumes of acetone added directly to the gastric juice (acidity about 0.15 normal); the filtrate is obtained after standing 24 hours at room temperature.

(2) Heat coagulation on a boiling water bath, with the acidity adjusted to about 0.15 normal, gives good results only when the temperature of

* Leonard, S. L., Hisaw, F. L. and Fevold, H. L.: *Proc. Soc. Exper. Biol. & Med.*, 1933, 33: 319.

TABLE

Extract used	No. of rats	Mode of injection	Time (days)	Vaginal smear	Corpora lutea	Weight of ovaries mgm.
Gonadotropic (cattle)	8	Subcutaneous	6	+	+	40
Gonadotropic (cattle)	16	Intraperitoneal	6	neg.	±	16
Gonadotropic (sheep)	7	Subcutaneous	6	+	+	212
Gonadotropic (sheep)	5	Intraperitoneal	6	neg.	+	21
Gonadotropic (pig)	6	Subcutaneous	6	+	+	115
Gonadotropic (pig)	6	Intraperitoneal	6	neg.	+	31
Gonadotropic (cattle)	5	Subcutaneous	3	+	+	78
Gonadotropic (cattle)	8	Equal amounts subcutaneously and intraperitoneally*	3	2 + 6 neg.	+	22

* Intraperitoneal injections given for 3 days prior to commencement of subcutaneous injections.

(In abstract)

the gastric juice is raised to the coagulation point within 1 to 2 minutes.

(3) Heat coagulation carried out as above, but in the presence of trichloroacetic acid (equal volume of 15 per cent solution), gives more consistent results than procedure (2) and therefore is to be particularly recommended for routine work.

Procedures (2) and (3) gives figures for non-protein nitrogen about 10 per cent higher than does procedure (1). Somogyi's method also gives very consistent results, the values for non-protein nitrogen being on the average 15.5 per cent lower than by procedure (1). The Folin-Wu method in various modifications was found to be entirely unreliable. When the final pH is higher than 2.8, tungstic acid does not produce any precipitation. With the increase of acidity more and more nitrogen is precipitated until at pH of less than 1.0 the amount of nitrogen precipitated approaches very closely to that precipitated by phosphotungstic acid. Trichloroacetic acid, when added directly to gastric juice of normal acidity (about 0.15 normal) in amount of from 5 to 10 per cent, does not cause any precipitation within 24 hours at room temperature. However, at 38° C. the proteins of gastric juice are precipitated completely in about 3 hours. When trichloroacetic acid (5 or 7.5 per cent concentration) is added to the previously neutralized gastric juice, precipitation of protein material takes place, but it is not complete even when supplemented by boiling.

Gastric juice secreted in response to sham-feeding and the psychic secretion give the highest figures for protein nitrogen. Variations are: total nitrogen, from 30.8 to 16.5 mg. per cent; protein nitrogen, from 19.9 to 9.9 mg. per cent; non-protein nitrogen, from 12.0 to 6.6 mg. per cent. With the increase in intensity of nervous stimuli the increase in protein nitrogen is especially striking. The percentage of non-protein nitrogen with regard to total nitrogen is fairly constant: variations, from 31.5 to 40 per cent; average, 36.1 per cent.

Gastric secretion provoked by injection of histamine (0.05 mg. per 1 kg. weight) is characterized by the low content of protein nitrogen (about 2 to 3 mg. per cent). At the beginning of secretion the protein nitrogen is much higher than at its height. The values for non-protein nitrogen varied from 5.88 to 9.52 mg. per cent, these being equal to from 45 to 78 per cent of the total nitrogen.

The partition of non-protein nitrogen was studied in the acetone filtrates (procedure 1) obtained from large amounts of gastric juice secreted in response to sham-feeding. Urea, ammonia and other volatile bases (derivatives of

trimethylamine) and creatine constitute about 20 per cent of non-protein nitrogen. About 37 per cent of non-protein nitrogen is represented by the physiologically important fraction of nitrogenous bases precipitable by phosphotungstic acid.

H. E. RAWLINSON, Department of Histology and Embryology, McGill University—The Factors Controlling the Secretory Activity of Different Types of Epithelial Cells in the Submaxillary Gland.

This work was designed to confirm and extend previous studies on this subject. There are three main types of secreting cells in the cat's submaxillary gland. Of these, one, the alveolar cell, discharges secretion under chorda tympani (parasympathetic) stimulation. A second type, the demilune cell, reacts to sympathetic and adrenalin stimulation, as shown by the development of a pronounced vacuolation in these cells. This latter finding is confirmed by (1) histological studies on the gland after augmented secretion (a sympathetic secretion augmented in amount by a previous stimulation of the chorda tympani when the latter's secretory effect is paralyzed by small doses of atropin); (2) similar studies of sympathetic and adrenalin action on the paralytic gland (a gland in which the chorda tympani had been cut some time previously). In such glands a marked sympathetic-demilune relationship is shown. The third secreting element, the striated duct cell, reacts both to parasympathetic and sympathetic stimulation, but the exact relationship is not clear. Further information is supplied by a study of a series of paralytic glands; in them the striated ducts are markedly affected, and, as such changes appear to be correlated with engorged blood vessels, the suggestion is made that the mechanics of the blood flow may be the important factor controlling the secretion of this third element.

L. I. Pugsley, Department of Biochemistry, McGill University—Calcium Excretion in Lactating Rats.

It has been shown that the weaning of lactating rats causes an increased excretion of calcium in the urine. The removal of the ovaries following the administration of anterior-pituitary-like hormone to rats caused mammary gland development, but did not bring about sufficient milk secretion to cause any increased calcium excretion in the urine. Rat's milk, as shown by the analysis of the ash of the stomach contents of suckling rats, was found to contain a higher percentage of calcium than has been reported for the milk of other species.

J. S. L. BROWNE

Special Correspondence

The London Letter

(From our own correspondent)

The Coroner's Inquest is one of those curious and typically English institutions which has its roots in antiquity, and has, according to some people, little to justify its continued existence, except in a modified form. It is said that they do these things much better in Scotland, but the Departmental Committee appointed just a year ago to inquire into the present law and practice in this country has concluded that the Scottish system cannot easily be adopted here. The report of the Committee is unanimous that the office of Coroner should be retained, but it is laid down quite clearly that his jurisdiction is to be limited to the investigation of the facts, how, when and where the death occurred. There is to be no question of any trial of liability, whether civil or criminal. This conclusion is important, for there is no doubt that in recent years when murder has been suspected, there has been in effect a preliminary trial before the Coroner in a court where the rules of evidence are not the same as in ordinary criminal proceedings. It is also recommended that the verdict in cases of suicide should not include reference to the state of mind of the diseased and that the mere fact "died by his own hand" is to be sufficient. There are many other minor recommendations, but the findings mentioned, are, on the whole, the most important. It is further laid down that in future only solicitors and barristers should be appointed as Coroners and also that post-mortem investigations ordered by Coroners shall only be made by pathologists whose names are on a special list.

Some time ago the organization known as the National Birthday Trust Fund asked the British College of Obstetricians and Gynaecologists to carry out an investigation on analgesia suitable for administration by midwives. The report has now been issued, in which it is concluded that chloroform by any method should not be used by midwives acting alone. This conclusion, it is said, has been reached with regret, and, of course, it does not affect the use of chloroform by medical practitioners. On the other hand, it is suggested that the use of gas and air by the latest type of apparatus is safe for use by midwives in hospital, provided that special training can be carried out. The adaptation of such a method for use in the home requires further investigation, and there are certain practical difficulties to be overcome as well as the question of cost. It must be confessed that this report has been received with some disappointment. Certain experts have claimed that the chloroform capsule method when used for women in

normal health is harmless, fool-proof, easily learnt, and reliable in relieving pain to some extent in a high proportion of patients. It is not at all clear from the report that the fatal cases recorded are really fairly used in evidence against the extremely compact and handy method of the chloroform capsule. However, it will be agreed by all that safety must come before comfort in this matter, and it is hoped that further experience may enable a satisfactory method to be found.

There was once a bacteriologist who, after twenty-five years' work, came to the conclusion that bacteria were not the cause of disease, but merely invaded pathological tissues to make life more complicated. Much the same thoughts must have arisen in the minds of the audience at a recent discussion held on the subject of sterilized surgical catgut. There have lately been some groups of cases in hospitals in all parts of the country of tetanus arising after operation, and this naturally led to an investigation of the method by which the catgut used had been sterilized. Although the incrimination of the bacillus of tetanus had failed in the cases investigated it was found that the method of sterilization employed at one hospital in which cases of tetanus had occurred was quite ineffective for killing tetanus spores. The Ministry of Health authorities have therefore concluded that in all probability infection had arisen from imperfectly prepared catgut. An element of doubt crept in when bacteriologists followed the Ministry's representative in the discussion, for several speakers urged that tetanus in catgut was a bogey, and one authority said that we had yet a long way to go to prove that catgut was ever the source of post-operative tetanus infection. It is important to note that under our new Therapeutic Substances Act the general sterility of surgical catgut sold in this country has been raised to a satisfactory level, and it is the "home-cured" variety which apparently causes danger, if any.

The Eugenics Society, which for a long time has seemed to the layman to be rather an academic body, has now come out with a very practical series of pamphlets including a special form to be filled up for applicants wishing to have a prenuptial bill of health. If there is any doubt about some problem in heredity, the Society is prepared to obtain expert assistance, and the questions for the application form are so formed as to enable timid subjects to obtain advice on sexual problems which may be worrying them. The whole scheme is designed to enlist the services of the family doctor and it seems to represent a very useful service for those about to marry.

ALAN MONCRIEFF.

121 Harley St.,
London, W.1.

The Edinburgh Letter

(From our own correspondent)

The recent by-election in connection with the vacancy in the parliamentary representation of the Scottish universities resulted in the return of the Rt. Hon. J. Ramsay MacDonald. The question of university representation was the subject of an inter-university debate held recently in the Edinburgh University Union. The motion was "that university parliamentary representation be abolished". The supporters of the motion stated that university representation was simply plural voting and was not a particularly logical form of plural voting at that. They believed that university representation was a privileged representation and as such should not be tolerated in a democratic country. It was also argued that it was mere hypocrisy to talk high-falutin nonsense about bringing a breath of university culture into party life. The opponents of the motion considered that the real question for consideration was whether university graduates could justly be called an independent community worthy of representation in Parliament. They maintained that they could quite justly be so regarded. Graduates formed a completely heterogeneous community of a certain description of people, and they were also subject to a considerable amount of parliamentary legislation. It was only fair therefore that they should be represented in Parliament in defense of their own interests. It had to be remembered that university representatives did not really represent universities themselves; they represented not only university opinion but graduate opinion. The motion was carried by a small majority.

The death has occurred of Sir John Marnoch, Emeritus Professor of Surgery at Aberdeen University. Sir John, who was in his 69th year, retired in 1932 from the Regius Chair of Surgery after holding the appointment for twenty-three years. He was a former honorary surgeon in His Majesty's Household in Scotland. Sir John had been in failing health for some time and the last occasion on which he left home was at the end of September, when he attended at Aberdeen Station, along with the Lord Provost and Magistrates of the City, to greet His late Majesty King George when travelling south at the close of his holiday at Balmoral Castle.

An appeal to employers of labour not to penalize unjustly employees who have suffered from mental disease was recently made by Prof. D. K. Henderson, Physician-Superintendent of the Royal Edinburgh Hospital for Mental and Nervous Disorders. Occasionally it was found that people were penalized for having suffered from a mental disorder and found reinstatement in their former position difficult. Such an attitude was both uncharitable and unjust, and merely tended to keep alive the so-called stigma, where there should be none. It should be realized that a mental disorder was not something which was incurable and persistent or

that the efficiency of the individual was so interfered with that he would never be fit for responsible work again. There were many excellent people occupying high positions of responsibility who at one time or another in their lives had suffered from a mental breakdown. They should receive all honour instead of stigmatization for having successfully overcome their obstacles. Professor Henderson also referred to the somewhat paradoxical situation which has arisen in that, while physical health was being conserved to an increasing extent and expectation of life had increased, there had arisen a greater potentiality for the development of nervous and mental illness. This was so much the case that there were those who argued that, racially, the improvement of environmental conditions merely led to the conservation of the unfit, and that these activities, in consequence, were dysgenic rather than eugenic. He thought that perhaps too great an emphasis was placed on the development of physical health and too little attention directed to the fact that good physical health without good mental health was valueless. Mental and nervous disorders were no more mysterious than many other disorders, and a study of the individual and environmental factors which had gone to the building up and integration of the personality resulted in revealing those physical or psychic forces which were at the root of the illness. The psychiatrist was in a better position than most people to realize the significance of these matters in their relation to the welfare of the community and the nation. Happily, however, there was no need to paint an alarmist picture. It was true that there had been a slow and steady increase in the numbers of patients treated and cared for in mental hospitals, but this was explained by the fact that in this individualistic age, when women were wage-earners as well as men, fewer were left at home to care for dependent relatives, and in consequence mental hospitals were more frequently used than was formerly the case. As a corollary of this, the interesting finding emerged, that while the adequate employment of men in industry resulted in a decrease of nervous and mental disorder the converse held in relation to women.

The vital statistics for Scotland for the year 1935 have just been issued. It is interesting to find that the infantile mortality rate was 76.8 per 1,000 births, which is 5.2 below the average and is the lowest on record. There was also a marked saving in the deaths of other children of pre-school age. Births numbered 87,923, representing a birth-rate of 17.8 per 1,000. This number is 913 fewer than in the previous year. The death rate from all forms of tuberculosis was 74 per 100,000. This is also the lowest on record. Deaths from all causes numbered 65,331, equal to a death-rate of 13.2 per 1,000.

R. W. CRAIG.

7 Drumsheugh Gardens, Edinburgh.

Medico-Legal

Summary of Canadian Legislation of Medical Interest Passed During 1935

What follows is a summary of the legislation passed during the last sessions of the federal and of the various provincial legislatures that is of particular interest to hospitals, medical men, pharmacists and nurses. It is not too much to say that the whole question of the relationship of the profession to government is now at a most critical stage. The volume of legislation passed in one session directly aimed at the medical practitioner is surprising. Whether that legislation be good or bad in principle, much of it in the form in which it has become law is undoubtedly hasty and ill-considered. The summary that follows is not designed primarily to give the medical man detailed information as to the manner in which his status has been affected in particular instances so much as to inform him of recent trends in the rapidly increasing interference of government in the affairs of the individual. Particular attention should be paid to *The Alberta Health Insurance Act* of Alberta; and the *Registered Nurses Act* and the *Pharmacy Act* of British Columbia; *The Mental Hospitals Act, 1935* of Ontario; *Private Hospitals Act* and the *Charitable Institutions Injured Persons Costs Payment Act* of Quebec; *An Act to Amend the Town Act, An Act to Amend the Village Act, The Rural Municipality Act, 1935* of Saskatchewan.

The Dominion of Canada

25-26 GEORGE V. (1935)

The Statutes of the Dominion of Canada for the last session contain no measures specifically affecting hospitals, medical men, pharmacists, or nurses. Most of such legislation is, of course, within the exclusive competence of the various provincial legislatures.

The Provinces

ALBERTA

25 GEORGE V. (1935)

Health Insurance.—Chapter 49, "The Alberta Health Insurance Act,"* is an important piece of social legislation. The implications of legislation such as this, which are most serious, should be weighed by the profession not only in Alberta but in the whole of Canada. This particular Act authorizes the Lieutenant-Governor in Council to appoint a Health Insurance Commission consisting of three members, of whom one must be a medical man, to hold office for terms varying from eight to ten years. The Commission, with wide powers to summon witnesses, is to decide all questions arising under the Act, and its decisions are not subject to review by the courts. More particularly, it is to collect all sums payable by municipalities under the Act, to appoint such officers and make such regulations as are necessary for the proper carrying out of the Act, and, after a survey,

to divide the Province of Alberta into the necessary medical districts.

Provisions are made for the constitution of these medical districts. The Commission must, if it receives requests in the required form, and may, always at its discretion, put to the vote of the electors in a proposed district whether they are in favour of its being created a medical district for the purpose of the Act. In each medical district there is to be an advisory board upon which the municipalities are to be represented. The board must meet at least once every six months, and may make recommendations to the Commission as to the administration of its own district. Provisions are also made for the appointment of professional boards of reference and local boards of reference.

As soon as a medical district is instituted every municipality included in it must proceed to take a census of all people in the municipality, and must ascertain if they are residents and whether they are wage earners or not. A register of this information is to be kept by the secretary of each municipality.

Each year thereafter every municipality included in the medical district must contribute a sum equal to \$11.25 for each resident. Similarly, for each resident the Province must pay annually the sum of \$3.22. Every wage earner, then, contributes \$2.01 per month. Every employer of a resident in the district must contribute \$0.81 per month for each employee. The Act makes provision for casual employment, and for the variation of these payments in particular instances.

Every resident of the district, whether of course he is liable to these contributions or not, is entitled to receive free of charge any necessary hospitalization in a public ward, any necessary nursing services, any necessary medical and surgical attention, any necessary dental attention, the benefit of laboratory services, including x-rays, and drugs and other supplies prescribed for him. Such resident may consult any medical practitioner, or dentist in his own district, who is then paid by the Commission.

From the wording of the Act it is not clear whether the medical man so consulted may refuse to accept a patient, and, if so, what a patient is to do who can find no doctor in his immediate vicinity to care for him. Nor is it clear how the Act affects a person who is not willing to be cared for in a public ward. From the point of view of the medical man in Alberta these must be important points. If a medical man attends a patient from another district he will not be paid by the Commission unless the patient has been referred to him by a medical man from the patient's own district. If the Commission decides, after the proper investigation, that the services rendered were unnecessary then the medical man cannot collect from it. His only recourse is against the patient.

Finally, the Commission is empowered to set up services for the promotion of public health within each medical district. *Inter alia*, it may establish pre-natal clinics, periodic health examination of all children, and may provide for vaccination and inoculation, the control of milk and food supplies, and may set up dental preventive services.

Public Health.—Chapter 50 contains minor amendments to "The Public Health Act", Revised Statutes of Alberta, 1922, chapter 58.

Towns and Villages.—Sections 10 and 12 of "The Town and Village Act Amendment Act, 1935", Chapter 54, permit town and village councils to enter into contracts with hospitals for the hospitalization of their residents, and to enter into contracts, subject to approval of the electors and of the Minister of Health, for the supplying of medical care and attention to their residents.

* See also this *Journal*, 1935, 33: 114.

BRITISH COLUMBIA

25 GEORGE V. (1935)

Sanatoria.—Chapter 13, the "Coquitlam Sanatorium Act", provides for the establishment and maintenance of the Coquitlam Sanatorium for the treatment of sufferers from tuberculosis. It is provided that where a patient at the time of his admission has a permanent abode in a municipality, the municipality shall pay towards his maintenance the sum of \$1.25 per day. The Lieutenant-Governor in Council is empowered to make regulations for the purpose of carrying into effect the terms of the Act.

Nurses.—Chapter 53 is entitled the "Registered Nurses Act". By it is constituted the "Registered Nurses' Association of British Columbia" in which all persons registered under the Act are to have membership. Provision is made for a Council of twelve members who have power to make regulations for the examination of applicants for registration and generally for carrying out the provisions of the Act.

The Council is directed to keep a register in which is to be entered the name of every member of the Association. Only those on the register are deemed to be qualified to use the title of registered nurse. The requirements for registration, which include the passing of an examination, are laid down.

Section 23 lays down the requirements for an approved training school for nurses within the meaning of the Act. Such training schools must offer a three years' course of instruction by qualified instructors in the following departments of nursing: medical, surgical, obstetric, pædiatric and dietetic. These departments must be connected with a general hospital having a daily average of at least fifty patients, with a general hospital or a special hospital having a daily average of thirty-five patients, which is affiliated with an approved general hospital in such a way that the instruction lacking in the affiliated hospital can be given, or with a general hospital connected or otherwise affiliated with a university where pre-clinical instruction is given. In the case of a hospital affiliated with a university the length of the practical course otherwise required may be shortened. Members of the Association shall be required to pay an annual fee of not less than \$1 or more than \$10 as required by the Association rules. They shall then be entitled to obtain an annual certificate under the seal of the Association. Applicants who have passed the required examination are entitled to have their names placed upon the register, to receive a certificate of registration, to practice professional nursing within the Province, and to use the title "R.N." or "registered nurse", the whole upon payment of a fee of \$10. The Act contains full provisions regarding the appointment of a Board of Examiners and the nature of the examinations to be given by them.

Optometry.—Chapter 55 contains certain amendments to the "Optometry Act".

Pharmacy.—Chapter 56 is the "Pharmacy Act". By it the already existing "The Pharmaceutical Association of the Province of British Columbia" is continued in existence, with a membership consisting of the present members and those who are admitted under the conditions prescribed by the Act. The affairs of the Association are to be conducted by a Council composed of six pharmaceutical chemists, constituted in the manner and with the powers laid down by the Act. Each year the Lieutenant-Governor in Council is to appoint a Board of Examiners to examine those who apply for registration under the Act. A list of persons entitled to be registered is kept by the Registrar, and provisions are contained in the Act as to the qualifications, in addition to the examination, required as a precedent to registration.

It is provided that no company shall sell or compound poisons, drugs or medicine unless the majority of

the stock is owned by and registered in the name of British subjects, unless a majority of the directors are duly registered as pharmaceutical chemists, and unless one of these directors personally manages the shop. No one is permitted to carry on business as a pharmaceutical chemist unless his place of business has been licensed under the Act, unless this licence is displayed in the shop, and unless over the door appear the words, "Licensed pharmacy".

The Act then sets forth a list of prohibitions. *Inter alia*, no one not registered under the Act can practise the profession of pharmaceutical chemist, or sell or compound poison, drugs or medicines. No such person may use the name "pharmaceutical chemist", "chemist and druggist", "druggist", "pharmacist", "apothecary", "dispensing chemist", "dispensing druggist" or similar names. The licence of a pharmaceutical chemist may be cancelled if he has been convicted of an offence against a statute relating to the sale of narcotic drugs, poisons, or alcoholic liquors, or of a crime involving moral turpitude, or if he personally makes use of poisons, narcotic drugs or alcoholic liquors.

In part 1 of Schedule A attached to the Act is a list of articles which a pharmaceutical chemist is forbidden to sell to anyone but a medical practitioner, veterinary surgeon or dentist or upon their prescription. Drugs mentioned in Part II of Schedule A must not be sold to anyone but a medical practitioner, veterinary surgeon, or dentist unless an entry of the sale is made in a register of poisons, the purchaser is known to the seller, and the container is labelled "Poison". Articles specially marked in Part III of Schedule A may be sold to anyone, but must be marked "Poison". The Act closes with provisions regarding penalties and prosecutions.

MANITOBA

25 GEORGE V. (1935)

Public Health.—Chapter 35 amends "The Public Health Act" in unimportant details.

Vital Statistics.—Chapter 56 contains certain minor amendments to "The Vital Statistics Act", an Act which is of some interest to the medical man.

Taxation.—Chapter 60, "An Act to Amend 'The Assessment Act'", by the addition of the word "hospital" after the word "church" in subsection 4 of section 3 of that Act exempts hospitals from assessment and taxation for school purposes.

NEW BRUNSWICK

25 GEORGE V. (1935)

Provincial Hospital.—Chapter 8 is "An Act to Provide for Renovation of the Old Part of the Provincial Hospital". It authorizes the issue of debentures in an amount not exceeding \$98,000 to cover the cost of certain necessary repairs to the hospital.

By chapter 27, "The Provincial Hospital Act" (chapter 107 of The Revised Statutes, 1927) is amended to permit the Lieutenant-Governor in Council to appoint a trust company to act with the chairman as Official Committee of the estate of every patient who has no official guardian.

Health.—Chapter 26 is entitled "An Act to Amend Chapter 59 of The Revised Statutes, 1927. The Health Act". The amendments refer to the formalities to be fulfilled by physicians and others attending at a birth, and by physicians last in attendance on a patient who has died or by the superintendent of the hospital where the death occurred. With certain exceptions in the case of rural districts, no body can be removed for burial until a permit for that person has been issued by a sub-deputy registrar of vital statistics after a certificate of registration of death

has been filed with him. The Chief Medical Officer is to be the Registrar-General of Vital Statistics.

Direct Relief and Other Purposes.—Chapter 61 “An Act to Authorize the City and County of Saint John to Issue Debentures for Direct Relief and Other Purposes”, authorizes the Council of the Municipality of the City and County of Saint John to issue debentures not exceeding \$8,500 for improvement at the Saint John Tuberculosis Hospital and not exceeding \$10,600 for improvements to the Saint John General Hospital.

Saint John General Hospital.—Chapter 63 is “An Act to Authorize the City and County of Saint John to make a Further Issue of Debentures for the Saint John General Hospital”. The Act limits these debentures to a sum not exceeding \$7,000, to be used for the purchase and installation of a new x-ray machine at the Hospital.

NOVA SCOTIA

25-26 GEORGE V. (1935)

Public Health.—Chapter 34 amends “The Public Health Act”, Revised Statutes, 1923, chapter 157, in certain comparatively unimportant respects.

Sydney City Hospital.—Chapter 50 is entitled “An Act to Incorporate Sydney City Hospital”. The administration of the Hospital is vested in a Board of Commissioners of seven members; four aldermen appointed annually by the city council, the mayor and medical health officer of the city *ex officio*, and an appointee of the Governor-in-Council. The Act contains provisions with regard to the rights and powers of the Board. Where patients are not resident in the city of Sydney and arrangements are not made by them or on their behalf for payment of their maintenance and treatment, this is chargeable to the municipality in which they are resident. But the patient, his executors or administrators, his father, grandfather, mother, grandmother, children and grandchildren are, to begin with, jointly and severally liable to the hospital for his maintenance, care and nursing.

ONTARIO

25 GEORGE V. (1935)

Consumptives.—Chapter 6, “The Burial of War Veterans Act, 1935”, repeals, *inter alia*, subsection 2 of section 21 of “The Public Hospital Act, 1931”, and subsection 2 of section 40 of “The Sanatoria for Consumptives Act, 1931”.

Dionne Quintuplets.—“The Dionne Quintuplet Guardianship Act, 1935”, chapter 19, must surely be one of the most unusual pieces of legislation ever passed. “Whereas,” says the preamble, “having regard to the special and unique circumstances touching the birth and survival of the quintuplet infant daughters of Oliva Dionne and Elzire Dionne, his wife, and for the better protection of their persons and estates and of their advancement, education, and welfare it is in the interests of the said children and in the public interest that a special guardianship be created”.

The quintuplets are declared to be the special wards of His Majesty the King, represented by the Minister of Public Welfare for Ontario. The Minister is constituted special guardian of the children, and, upon his recommendation, the Lieutenant-Governor in Council is empowered to appoint a guardian or guardians to act with the father as active guardians.

The Minister is authorized to enter into contracts, or to authorize the active guardians to enter into them, with respect to the children's estates, and it is provided that any contract entered into by any persons other than the Minister or the authorized active guardians shall be null and void. But this

is not to effect the validity of contracts entered into before the present Act by the previous guardians.

The estates of the children are vested in the Minister of Public Welfare who is to hold their property in trust for them or their survivors. The father is to continue as natural guardian, but is subject to the Act and to the jurisdiction of the Minister. Then, from the point of view of interference with the rights of parents, follows one of the most extraordinary provisions of this extraordinary statute. Section 8 provides that, “Except as provided by this Act or as duly authorized by the said Minister or the said active guardians, no person whatever shall in any way possess or have the persons of the said children or any of them in his custody or control or in any way harbour them or take them from any custody, control or residence in which from time to time and at any time they may, with the authority of the said Minister or said active guardians, have been placed, and their residence, permanent or temporary, shall only be at such place as the said Minister or said active guardians may from time to time direct.”

Section 10 protects Dr. Dafoe's professional privileges: “Nothing in this Act contained shall in any way interfere with or affect such professional or private and personal rights as Allan Roy Dafoe, of Callander, M.D., may have in relation to the said children and his services for them; and the said Allan Roy Dafoe shall for his professional and other services be paid out of the estates of the said children such sums as the Minister or the said active guardians may from time to time authorize and direct.”

Mental Hospitals.—Chapter 39, “The Mental Hospitals Act, 1935” consolidates and amends existing statutes on the subject. It is too long, however, to summarize adequately here. The Act is under the administration of the Hospitals Division of the Ontario Department of Health. At the outset it sets forth the conditions of admission into institutions covered by it. Patients mentally ill may be admitted voluntarily. Patients mentally ill or mentally defective may be admitted as certified patients, Deputy Ministers' warrant patients, Lieutenant-Governor's warrant patients, or as patients remanded by a judge or magistrate, upon the conditions there laid down. For each of these different classes different conditions are laid down before a patient can be discharged.

Epileptics, it is provided, are to be cared for in the Ontario Hospital, Woodstock, which with all appurtenances is to be for the public use of the Province. Provisions are made for examination units and for mental health clinics. The staff of these clinics is to consist of an officer in charge, an assistant trained in psychology, an assistant trained in social service and such other assistant as may be necessary. The clinics are authorized to carry out mental and physical examinations of adults submitting themselves voluntarily, of infants at the request of their parents, or of persons sent by certain approved organizations, and of persons on the order of a magistrate. Under certain conditions examinations may be carried out in schools.

Psychiatric Hospitals.—Chapter 57 contains certain amendments to “The Psychiatric Hospitals Act.”

Public and Private Hospitals.—“The Statute Law Amendment Act, 1935”, which is chapter 66, contains in sections 14 and 15 amendments to “The Private Hospitals Act, 1931”, and “The Public Hospitals Act, 1931”, respectively.

Victoria Hospital.—Chapter 72 is “The Victoria Hospital London Act, 1935”. By it an agreement between the Board of Governors of the University of Western Ontario and the Board of Hospital Trustees of the City of London, of which a copy is attached to the Act in a schedule, is declared binding on the parties. By this agreement a Medical Advisory Board and a Joint Relations Committee of the Hospital and the Uni-

versity are set up. The Joint Relations Committee are to consider matters of mutual interest to the Hospital and the University, and appointments to the Hospital staff are to be subject to their approval. The appointments of interns are made on the recommendation of the Medical Advisory Board.

It is provided that members of the profession in London who are not on the Hospital staff shall have the right to attend patients in private and semi-private rooms. As a matter of professional courtesy such doctors may in consultation with the head of the service concerned visit patients referred by them to the public wards. Patients in the public wards are to be available for the clinical instruction of the students in the medical faculty.

Public Health in the City of Windsor.—Chapter 74, "The City of Windsor (Amalgamation) Act, 1935", contains in section 15 provisions regarding the creation of a board of health consisting of five members to have incidentally the control and management of the Metropolitan Hospital and the Metropolitan Isolation Hospital.

PRINCE EDWARD ISLAND

25 GEORGE V. (1935)

Public Health.—Chapter 13 contains certain minor amendments to "The Public Health Act, 1927".

QUEBEC

25-26 GEORGE V. (1935)

Insane Asylums.—Chapter 2 is entitled "An Act to ratify the contract between the Provincial Government and *Les Sœurs de la Charité de Québec* respecting the care, custody and maintenance of the insane in *Hôpital Saint-Michel-Archange*". The contract attached to the Act, and ratified by it, is typical of several entered into by the Provincial Government.

This particular one refers to what is commonly called the Beauport Asylum. By it the Sisters agree for a period of ten years to receive, lodge and clothe in their asylum all patients confided to them by the Provincial Government, and it contains provisions with regard to the care and treatment to be given them. In return, the Government undertakes to maintain in the care of the Sisters at least 2,300 patients and to pay them the sum of \$200 per annum for each patient during the period of his confinement. In addition to this sum the Government agrees to pay the Sisters an annual amount of \$35,000 to cover the fees of physicians, a secretary, office and pharmacy expenses, and so on, and \$3.50 to cover the funeral expenses of every patient dying at the hospital.

Chapter 3 is an Act to allow the Lieutenant-Governor in Council to order the Provincial Government to pay out of the appropriations by the Legislature for lunatic asylums the interest and sinking fund charges on any new loans negotiated by *Les Sœurs de la Charité de Québec* to take the place of certain bond issues previously guaranteed by the Government.

Chapter 4 contains an Act entitled "An Act respecting the increasing of a subsidy to *La Communauté des Sœurs de Charité de la Providence* for the maintenance of St. Jean de Dieu Hospital". In 1934, by a contract similar to that mentioned above in connection with *Les Sœurs de la Charité de Québec*, the Provincial Government had granted *La Communauté des Sœurs de Charité de la Providence* an annual subsidy of \$52,500 to cover the fees of physicians, an enquiry commissioner, secretaries and the cost of the pharmacy, surgery, and so on, required in their care of the insane. By the present Act the subsidy is increased to \$62,500.

Chapter 62 is "An Act to authorize the Provincial Treasurer to make certain advances while awaiting the contribution from municipal corporations for reformatory and industrial schools and lunatic asylums".

Animal Health.—Chapter 31 amends the Revised Statutes of Quebec by adding as Chapter 70A the "Animal Health Protection Act". By it the Minister of Agriculture is ordered to direct the sanitation of herds and stables, and for that purpose to enter into the necessary agreements with farmers. Farmers owning stables free from disease may obtain a certificate to that effect.

Private Hospitals.—By chapter 66 the "Private Hospitals Act" is added to the Revised Statutes as chapter 189A. This Act covers "every institution, other than a public charitable institution contemplated by the "Quebec Public Charities Act" (Revised Statutes, 1925, Chap. 189), and other than a public institution receiving members of its staff or its pupils in its infirmary, in which, for payment, patients are received and treated for any cause whatsoever, or infants or young children are received, cared for or maintained." In this definition are included dispensaries, public consulting offices and clinics not subsidized by the Province and which are not attached to hospitals recognized as public charitable institutions.

The Act provides that no one shall operate or manage a private hospital until he has obtained a licence. The licence is obtained by application to the Provincial Treasurer accompanied by a fee of \$5.00 and a report signed by the director of the Quebec Bureau of Public Charities to the effect that the hospital has observed the provisions of the present Act, the regulations adopted under it, and the provincial health regulations. The licence must be renewed each year. An interesting provision is that the licence may be cancelled at any time if, among other things, the hospital has attached to its staff a physician found guilty of an infringement of his professional duties by the Council on Discipline of the College of Physicians and Surgeons of the Province of Quebec.

The Act provides that a register must be kept in every private hospital showing the date of entry, sex, age, name and address of the inmates and the date of their discharge or death. In the case of lying-in hospitals or of crèches the register need mention only the date of birth of the child. Penalties are provided for infractions of the provisions of the Act.

Adoption.—Chapter 67 is "An Act to amend the Adoption Act" (Revised Statutes, 1925, Chapter 196).

Burial and Embalming.—Chapter 68 is "An Act to amend the Burial Act respecting the embalming of bodies" (Revised Statutes, 1925, Chapter 208). The amending section provides that "The body of no person shall be embalmed before the obtaining of a certificate of death signed by a physician, nor may it be buried or cremated until the expiry of at least twenty-four hours after death". By this amendment no change is made in the time within which burial may take place.

Pharmacy.—Chapter 69 is "An Act to amend the Quebec Pharmacy Act" (Revised Statutes, 1925, chapter 215).

Payment of Hospitals and Physicians.—Chapter 85, the "Charitable Institutions Injured Persons Costs Payment Act", is a piece of legislation with interesting and important implications. The Act benefits any institution recognized by the Lieutenant-Governor in Council as a public charitable institution, and applies to any person who as the victim of an accident is admitted to the institution in virtue of the Quebec Public Charities Act or is treated in its public wards, although he does not come within the scope of that Act because of his domicile.

It provides that when any such person makes a claim for damages resulting from an offence or quasi-offence he must include in his claim the account of the institution where he has been cared for and the accounts of the members of the staff who have treated, operated on, or cared for him. Provided the institution carries

out the formalities required of it with respect to the filing of a declaration and of detailed accounts, no settlement of such a claim is valid unless the amounts are paid directly to the institution or physicians concerned. Any amount granted by judgment for hospitalization and medical costs must in the same way be paid over direct. If direct payment is not made the hospital and physicians may sue both the victim of the accident and the person effecting the settlement for their services, and in that event the question of liability for the offence or quasi-offence cannot be raised.

Incorporations.—By chapter 154 *Les Sœurs des Sacrés-Cœurs de Jésus et de Marie* are incorporated to carry on the education of children and to care for the sick.

By chapter 156 *Les Oblates Franciscaines de St. Joseph* are incorporated to hospitalize, treat and instruct sick, convalescent, invalid or epileptic girls and women.

By chapter 157 the Charter of the *Hôpital St. Joseph des Convalescentes* is amended.

By chapter 158 provisions are made regarding the sinking fund of certain bonds issued by *Hôpital St. Luc*.

SASKATCHEWAN

25 GEORGE V. (1934-1935)

Town Physicians.—Chapter 28, "An Act to Amend The Town Act", adds sections 249a and following to that Act. These sections empower town councils to engage a legally qualified medical practitioner for the town at a salary not to exceed \$2.00 per head of the town's population. A by-law to that effect may be introduced by the council on its own initiative, and must be introduced if a petition is presented signed by not less than 25 per cent of the resident ratepayers. In either case it must be submitted to the electors for their approval.

Village Physicians.—Chapter 29, "An Act to amend The Village Act", adds to that Act, in section 157a and following, provisions practically identical with those just referred to in the case of towns.

Rural Municipalities.—Chapter 30, which is "The Rural Municipality Act, 1935", contains frequent provisions relating to hospitals and to physicians and nurses. Section 177 empowers the council of municipalities to pass by-laws relating, among other things, to the health of the municipality and the prevention of the spread of communicable diseases, to the granting of aid not exceeding \$1,000 in any one year to hospitals, to uniting with other municipalities in establishing hospitals, to uniting with other municipalities in the organization of health districts and in the maintenance of a medical and sanitary staff, and to granting aid to the Canadian Red Cross Society and similar organizations. The section also empowers the councils to pass by-laws making a grant not exceeding \$1,500 a year to a legally qualified physician, or guaranteeing his salary up to the same amount, to induce him to take up practice within the municipality. Grants may similarly be made to qualified nurses to induce them to practise their profession within the municipality.

The Act, in sections 178 and following, contains provisions relating to the hiring of physicians by the councils of municipalities similar to those referred to above in the case of towns and villages. Where one physician is hired for the whole municipality his salary is not to exceed \$5,000 a year, unless the municipality comprises more than nine townships, when there may be an increase of \$500 for each additional township. Similarly the council may engage a medical practitioner for three or more townships within the municipality, in which case his salary is not to exceed \$750 per township, or \$5,000 in all.

In sections 232 and following are provisions for the care of the indigent sick and destitute. In a word, it is

the responsibility of the municipality to make provision for indigent persons who have been residents of the municipality for at least thirty days and who are in need of medical attention. Hospitals which have admitted indigent patients at the request of the municipality, or in an emergency without that request, may collect from the council a sum not exceeding \$2.50 a day during the patient's stay. Such expenses may be recovered by the municipality from the patient or from certain of his relatives. None of these provisions however, are to be held to exclude the municipal council from entering into agreements with hospitals for the care of patients on such conditions as may be agreed upon.

Public Health.—Chapter 65 contains a minor amendment to "The Public Health Act".

Limitation of Actions Against Hospitals.—Chapter 81 adds section 10 to "The Hospitals Act". Under this section no action in damages can be taken against those operating a hospital after the expiration of three months from the date upon which the damages were sustained, unless within one year a judge of the Court of King's Bench gives permission, upon the completion of certain formalities.

Union Hospitals.—Chapter 82 contains certain amendments to "The Union Hospital Act", particularly with regard to the temporary closing of a union hospital by its board.

Tuberculosis Sanatoria.—Chapter 83 contains a minor amendment to "The Tuberculosis Sanatoria and Hospitals Act". Chapter 84 is "The Tuberculosis Sanatoria Superannuation Act, 1935". G.V.V.N.

Abstracts from Current Literature

Medicine

Renal Amyloidosis. Altnow, H. O., Van Winkle, C. C., Maly, H. W., and Williams, L. E., *Arch. Int. Med.*, 1935, 56: 944.

This paper is confined to a study of 16 cases of renal amyloidosis in which a clinical diagnosis was made during life and confirmed by post-mortem observation of amyloid deposits in the kidney. The presence of amyloid matter was considered established when demonstrated by a methyl violet stain in the microscopical sections. As a result of their experience, the authors believe that if in the course of advanced pulmonary tuberculosis complicated by a suppurative process both albumin and casts appear in the urine in considerable amounts a diagnosis of renal amyloidosis may be entertained, with the expectation that further study will confirm it. If associated with these changes, the liver and spleen are enlarged, the diagnosis may be considered reasonably well established. If the liver and spleen are not enlarged, the presence of oedema, normal or low blood pressure, hyposthenuria, a normal output of dye, normal non-protein nitrogen and normal fundi support the diagnosis.

The most frequent clinical complication of tuberculosis was enteritis, while the most com-

mon complication observed post mortem was tuberculous adenitis. The average duration of albuminuria and cylindruria was thirty months. With only one exception, the ability of the kidneys to secrete urine of normal specific gravity was lost. Hypertension, arteriosclerosis of the retinal vessels, and retinitis did not enter into the clinical picture.

The liver was enlarged clinically in 7, and the spleen in 5 of the 16 cases. Hence, if enlargement of the liver had been made a requisite for a positive diagnosis of renal amyloidosis the percentage of diagnostic error would have been 44 per cent. If the usual textbook triad of the older clinicians of chronic suppuration, enlarged liver and spleen demonstrable by physical examination, and albuminuria had been insisted upon, the diagnostic error would have been 75 per cent.

LEYLAND J. ADAMS

Cataracts and Dinitrophenol. Cogan, D. G. and Cogan, F. C., *New Eng. J. Med.*, 1935, 213: 854.

In the last three months 20 cases of cataracts developing after the use of dinitrophenol have been reported. The average age of occurrence is 37.9 years, with extremes of 25 and 50. With one exception all the cases occurred in women. Except one patient all were taking dinitrophenol in the recommended therapeutic doses, and the majority were taking it under the supervision of a physician. The average loss of weight recorded was 50 pounds. In only three of these cases were other toxic symptoms noted.

Tissue anoxæmia may account for much of the damage to the lens. Dinitrophenol apparently increases the cellular metabolism to a degree inordinate with its oxygen supply. The tissues become acidotic, lactic acid is piled up, and the products of decomposition are incompletely oxidized. Marked reduction of the toxic effects of dinitrophenol is obtained by the inhalation of pure oxygen. The relatively remote position of the lens from its nutritive source renders it more vulnerable than other tissues. It seems likely that the cataracts are the result of damage to the lens epithelium rather than to precipitation of the lens constituents. This is why the toxic effects occur after prolonged use of the drug and may appear after the drug has been discontinued.

LILLIAN A. CHASE

A Family with Myotonia Congenita (Thomsen's Disease). J. Sanders, *Genetica*, 1935, 17: 253.

Sanders reviews the history of this interesting disease, which was first described by Thomsen in 1876 in order to save his son from punishment for malingering by the German military authorities. The disease is characterized by tonic contractions of the voluntary muscles whenever a voluntary action is to be

carried out, thus temporarily paralyzing the subject into complete immobility. Gradually the spasm relaxes, the patient begins to perform the act required, and, as he warms up, the spasm disappears and he proceeds normally. Following cessation of movement, the same cycle occurs at the initiation of the next voluntary act. Thomsen had suffered from this disease all his life, and been punished as a child for disobedience, when he failed to move as soon as he was spoken to. When his son was born with the same disease, he realized that it was a hereditary disease; and twenty years later, when this son was in military service, published a study of his own case and of several of his family to show that it was a disease which the individual could not overcome. Forty-seven years later Nissen, a member of the same family, brought the family tree up to date. His two brothers had joined the army in the world war. One of them was dismissed three days later, because at the command "March" he became frozen into immobility, and his comrades were far ahead of him before he could move. The other brother was not so fortunate, and in his regiment was accused of malingering and punished severely. Sanders remarks, "Had the military authorities learned nothing in over forty years?" Even in his new menial duties, his stiffness and inability to carry out commands was finally recognized as *bona fides*, and he was sent to the hospital for electrical treatment to limber up his muscles, where he finally came into the hands of a physician who understood the disease and released him. (Not so fortunate was the German soldier who was suffering from the same disease, and committed suicide rather than submit further to the punishment he was undergoing to break him of his malingering habits!)

Sanders then records a family in Holland who may have been a branch of the German family, but which could not establish connection therewith. Through six generations in which there were 133 men and women he traces the disease, affecting 32 men and 42 women, a total of 74 affected out of 133 persons, or a little over 55 per cent.

He concludes that the disease acts as a dominant, inasmuch as no unaffected person ever transmitted the disease to his children or descendants in this family. Approximately one-half of the offspring of an affected parent were affected. The sexes were affected approximately equally. These observations correspond to the rules required of dominance. There is no tendency to mental deterioration among the affected. Merchants, bank directors, professors, ministers, officials were among the affected. The disease is not fatal, but very embarrassing, for every attempt at voluntary effort is accompanied by spasm, so that in

shaking hands the victim can scarce initiate the motion in time to grasp the hand of the other person, but once having grasped it cannot let go. One man in order to talk had to move his jaws up and down with his hands to get them limber enough to speak.

MADGE THURLOW MACKLIN

Surgery

Fractures of the Spine. Irwin, S. T., *Brit. M. J.*, 1936, 1: 1.

The author discusses 34 cases of fractured spine.

Fractures of the atlas are tension fractures. A force transmitted through the skull tends to spread the lateral masses of the atlas laterally. Divarication of these masses occurs, the fracture being through the weaker posterior arch. Forty-five per cent of such fractures are not fatal, the cord escaping injury. There may be an associated fracture of the odontoid process. The diagnosis depends on the history, pain, inability to nod the head, to rotate it or support it without pain, rigidity of the neck muscles, and neuralgia or anæsthesia over the distribution of the great occipital nerve. Examination may show undue prominence of the spine of the axis, and an abnormal prominence of one side of the atlas in the pharynx. Stereoscopic skiagrams, lateral and antero-posterior, should be taken. The latter should be taken through the open mouth. Obvious deformity requires reduction. Immobilization in plaster-of-Paris, followed by the wearing of a leather collar is the treatment. Accurate knowledge of the condition of the odontoid should be obtained before attempting reduction.

The commonest site of fracture in the axis is the base of the odontoid process. It is diagnosed radiologically. It is treated by immobilization in plaster-of-Paris. Bony union is rare.

Injury above the fourth cervical segment without cord damage is usually a pure dislocation. There is deformity. The diagnosis is confirmed by x-ray. Reduction followed by immobilization forms the treatment. Except for pain, weakness, and stiffness the prognosis is good. Fracture-dislocations in this region usually produce severe cord lesions and rapid death.

Those with severe cord lesions below the fourth cervical segment may live some time, since the phrenic nerve escapes. The ultimate prognosis is bad. The diagnosis is made on the usual lines, including neurological examination, and is relatively easy.

Compression fracture of a vertebral body is the most important of all spinal injuries. It is the commonest form, comprising about 40 per cent of all spinal fractures. Seventy per cent escape gross nerve injury. It may be due

to slight violence. It is easily diagnosed. The results of treatment are, on the whole, good. Irreparable deformity results from failure of treatment.

In compression fractures the exciting cause is almost always indirect violence. Fractures of the lower two dorsal and upper lumbar vertebrae include more than 50 per cent of all fractures of the spine. The extent of the wedging depends on the amount of violence. Treatment is as advocated by Watson Jones, i.e., reduction by hyperextension, and immobilization in plaster.

Fracture of the coccyx results from a fall on the buttocks. It is most easily recognized by digital examination per rectum. The treatment consists in restoration to normal position, or excision.

Spinous process fractures are the result of direct violence. Following immobilization fibrous union results. Fractures of the laminae are due to direct violence. There may be cord symptoms. Open operation is indicated, especially if evidence of cord compression is present. The prognosis is good.

Fractures of the transverse processes are due to muscular contraction. The injury is unilateral, usually multiple, and always in the lumbar region. Immobilization in bed for two or three weeks is followed by massage and exercises.

STUART GORDON

Irreducible Intussusception. Elliot-Smith, A., *The Lancet*, 1935, 2: 992.

When in the operative treatment of intussusception it is found that the usual manipulative procedures will not relieve the condition, the question arises, what is the operation now offering the best chance of recovery? Delay in operating is responsible for the difficulties in reduction, the vascular obstruction giving rise to congestion, œdema, and finally gangrene of the intussusceptum and adhesion between the entering and returning layers.

Diagnosis is made on a history of acute abdominal pain, vomiting, tumour, and, usually, passage of blood per rectum. Delay in diagnosis is usually due to the absence of one of the above symptoms, e.g., waiting until blood is passed per rectum. Intussusception starting in the small bowel advances more slowly and is more difficult to diagnose than the common ileocaecal type. "The type of intussusception with milder symptoms is ultimately the most fatal."

Alternatives in the operative treatment of irreducible intussusception are (a) resection and anastomosis, and (b) artificial anus or short circuit to relieve obstruction. Resection in children under three years has a mortality of practically 100 per cent. The Bowerman-Jessett modification is technically difficult. The risk of sepsis and liability to stenosis later makes it an unreliable procedure. The cause of death in

fatal untreated cases is rarely peritonitis. Artificial anus is unsatisfactory in children, producing rapid and fatal dehydration. Lateral anastomosis (short circuit) relieves obstruction, largely avoids shock and dehydration. It has been successful in children as young as six months. Four cases are reported.

Conclusions — Irreducible intussusceptions showed indefinite signs and symptoms before operation. The lethal factor is intestinal obstruction. Peritonitis from a gangrenous loop is rare. When obstruction is relieved, no ill effects are observed from leaving the gangrenous loop in the abdomen. Short circuiting the obstruction offers the best chance of recovery.

S. A. MCFETRIDGE

Obstetrics and Gynecology

The Month of Conception of 935 Congenitally Malformed Individuals. D. P. Murphy, *Am. J. Obst. & Gyn.*, 1936, 31: 106.

Petersen has claimed that he found a concentration of congenital malformations in the areas of the United States which were what he termed "storm tracks". In a subsequent paper he asserts that there is also a seasonal variation in the conception times of malformed children, and he correlates this with variations in the barometric pressure. He has found that a disproportionately large number of malformed infants is conceived in the months of March and April in Chicago; in fact, 120 per cent of the expectancy is the disproportion he finds. He finds that the greatest variation in barometric pressure occurs in spring months, and he deduces that the latter is the cause of the former.

Murphy, in Philadelphia, has studied the conception times of 935 congenitally malformed children. The records were obtained over a five-year period, and the individual was listed as a case of congenital malformation only when the defect was obvious on the surface of the body or when autopsy revealed an internal defect. Such rigid exclusion of cases supposed to have a congenital defect not verified by autopsy or operation reduced the original number of records from 1,476 to 890. The mothers of 540 of these defective children were interviewed, and data obtained as to the conception time not only of malformed but of normal children. Thus, conception months for 2,525 persons were obtained, 1,590 normals and 935 malformed infants. When the data were plotted it was found that results just the opposite of Petersen's were obtained. More normal children and fewer malformed infants were conceived in the spring months than would be expected, and fewer normal children and more malformed infants were conceived in the summer months than would be expected. Baro-

metric records for this region for that five-year period showed that the period of greatest variability was in January, and the least in the summer months. Murphy attributes no significance to the variation in conception months which he found, feeling that the variations were not statistically significant. He concludes that for Philadelphia there is no evidence whatever to support the view that there is a seasonal trend toward the conception of malformed infants.

MADGE THURLOW MACKLIN

Pædiatrics

Coma with Glycosuria not due to Diabetes Mellitus. Fleming, G. B., Herring, A. and Morris, N., *Arch Dis. Child.*, 1935, 10: 397.

Glycosuria with hyperglycæmia does not necessarily indicate true diabetes mellitus. Nevertheless, the association of coma with glycosuria, even though acetoneuria is only slight, almost always leads to the diagnosis of diabetic coma. The authors report two cases in which there was profound coma with sugar in the urine where the symptoms were due to other causes.

The first case was in a boy of eleven years. At the age of two weeks he had suffered a depressed fracture in the left frontal region. Six months before admission he began to have attacks of headache and giddiness, followed by vomiting. On the evening before admission he became comatose, when he was sent to hospital as a case of meningitis. Kernig's sign was positive, but nuchal rigidity was only slight. Lumbar puncture gave 40 c.c. of clear fluid under greatly increased pressure. The cell count was 13 per c.mm. and the Pandy test was negative. The urine contained much sugar and a moderate amount of acetone and diacetic acid. Twenty units of insulin and 20 g. of glucose were given and the boy soon regained consciousness. Six hours later the blood sugar was 75 mg. per 100 c.c., and the urine contained only a trace of sugar. The right pupil was larger than the left and both fundi showed optic neuritis, with numerous hæmorrhages. Four months later the fundi were normal. Two years later sugar and acetone were found in a specimen of urine taken one hour after 43 g. of glucose had been given. The diagnosis here was suprapituitary tumour, probably an adamantinoma, giving the typical Fröhlich syndrome with disturbance of carbohydrate metabolism.

The second case was a boy of two years who was admitted in an unconscious state, but could be roused with difficulty. Temperature was 101° F. The Kernig sign and nuchal rigidity were absent. The urine contained much sugar and a faint trace of acetone, but no albumin. The child was treated for diabetic coma. The next morning he was awake, and the urine con-

tained no sugar. The blood at 9 a.m. that day gave 39 mg. of sugar per 100 c.c. The Wassermann test was negative. Six months later a skiagram of the skull revealed separation of the sutures and "splaying" of the sella, indicating increased intracranial pressure. At this time the urine was free from sugar and acetone, and the fasting blood sugar was 76.2 mg. per 100 c.c. The diagnosis was not certainly made, but some intracranial lesion seemed probable, possibly situated in the pituitary region.

JOHN NICHOLLS

Pertussis and its Treatment with Gold Tribromide. Epstein, J., *Arch. of Pediat.*, 1936, 53: 52.

Three hundred cases of whooping cough are reported. Two hundred and twelve of these were treated with tribromide of gold in the form of an elixir known as Elixir Bromaurate. In the other 88 cases, intended as controls, the usual remedies against whooping-cough were employed. Pertussis vaccine was used in 20 cases. The results were, without doubt, in favour of the gold treatment. This shortens the duration of the illness from months to weeks, and reduces the violence of the spasms of coughing. Gold tribromide is preferable to other salts of gold because in therapeutic doses it has no toxic action and can be given by the mouth, thus doing away with the disadvantages of hypodermic, intramuscular and intravenous medication. As tribromide of gold is incompatible with many drugs and is readily decomposed when dispensed in pills, capsules, and aqueous solutions care should be taken to employ only a reliable preparation, such as Elixir Bromaurate.

JOHN NICHOLLS

Ophthalmology

Pupillary Movements: A New Theory on the Pathogenesis of the Argyll-Robertson Sign. Buenafama, A., *Ann. d'Ocul.*, 1935, 172: 672.

The classical theory on pupillary movements to light, as well as on the passage of the reflex as universally accepted, is not justified by any physiological observation. The classical interpretation connected with photo-motor movements of the pupil does not explain the pupillary pathology. If we interpret the photo-motor reflex as we have done by supposing that there is a dilatation movement, the pupillary pathology is perfectly clear. The phylogenetic development of the movements of the iris is in accord with our interpretation and not with classical physiology. The typical Argyll-Robertson sign is due to paralysis of the dilator of the pupil. The author uses the word "typical" Argyll-Robertson because he thinks there exists an exception to this which does not

present all the characteristics, the pathogenesis of which will be shown in a later article.

S. HANFORD MCKEE

Uveal Sarcoma—Malignant Melanoma. Terry, T. L. and Johns, J. P., *Am. J. Ophth.*, 1935, 18: 903.

Malignant melanomata are relatively rare, being found on an average in 5 out of 10,000 patients who visit eye clinics. In 1931 Callender described 4, or perhaps 5, specific types into which all primary malignant uveal neoplasms can be classified. The age distribution was consistent with the findings of others. Among 94 cases, 55 occurred in the fourth, fifth and sixth decade. In the series of Terry and Johns the tumour was neither diagnosed nor even suspected in 42 cases. Recurrence in the orbit was rarely noted. In many cases the sclera had been deeply invaded, and in a number of these there was definite evidence that the tumour cells were left in the orbit at the time of enucleation. The liver is definitely the most fertile field for metastasis. There is no correlation between the shape of the tumour and malignancy. The nodular forms of malignant melanomata suggest the possibility of multiple origins, or intraocular metastasis. There were four possible sources of pigment in these tumours: (1) the true melanotic pigment; (2) normal chromatophore pigment of the uveal tract, engulfed by the growth of the tumour; (3) pigment epithelium of the retina; and (4) blood pigment from hæmorrhages. The retina was separated in 85 of 91 cases. Metastasis that becomes evident many years after enucleation may result from a more recent metastasis of orbital recurrence that is not recognized. The formation of pigment is unrelated to normal pigmentation of the eye and is probably of no prognostic value.

S. HANFORD MCKEE

Oto-Rhino-Laryngology

Some Œsophageal Affections in Young Children. Kelly, A. B., *J. Laryngol. & Otol.*, 1936, 51: 78.

The author describes his personal experience with Œsophageal diseases in infants and young children, and draws the following conclusions. Shortening of the Œsophagus may be congenital or post-natal, or may begin before birth and continue to develop after birth. In connection with congenital shortening of the Œsophagus and the associated thoracic stomach, the following points are stated: (1) that this abnormality is not so rare as at first supposed; (2) that in the early years of life the cardiac canal is liable to spasmodic closure, which causes regurgitation and wasting; (3) that the closure can be overcome by passing a bougie, and that opera-

tion is not needed; (4) that in later childhood there is less trouble from spasm; (5) that the writer knows of no death which could be directly attributed to inanition caused by obstruction of the cardiac canal of a congenitally short œsophagus; (6) that necropsies on adults have proved that the presence of a thoracic stomach due to congenital shortening of the œsophagus does not preclude the attainment of healthy old age.

Post-natal shortening and narrowing of the œsophagus was found in two cases due to spasm and associated with a large hiatal hernia. A spasm of the cardiac canal and at the lower end of the thoracic œsophagus gave a characteristic radiological appearance, as shown in two cases. In several of the cases described the shortening of the œsophagus was evidently due to both ante- and post-natal factors. The latter were mainly of the nature of an ascending fibrosis. This condition proved fatal in several instances.

GUY H. FISK

The Defences of the Air Passages. Thomson, Sir StClair, *J. Laryn. & Otol.*, 1936, 51: 1.

In this article, which is the Semon lecture for 1935, the author recalls an experimental study made forty years previously by Professor Hewlett and himself on the micro-organisms of the nasal sinuses in health. They demonstrated that in 80 per cent of the cases the nasal mucosa was sterile. An enumeration of the various methods of defence of the respiratory passages to bacterial infection follows. The mucus and the ciliary mechanism form the first and most important line of defence and depend on one another for their efficacy. There is a detailed description of the action of these cilia in the various nasal cavities and passages, together with the methods employed for studying them and their clinical and microscopic appearances in diseased conditions. The desire of the author is to show the complexity and perfection of these defences, their mode of action and interaction and that a knowledge of their normal activity must precede any attempt to study diseases of this region.

GUY H. FISK

Urology

The Present Status of Prostatic Resection.

Day, R. V., *J. Urol.*, 1935, 34: 428.

Not only does the mortality rate depend upon the type of case to be dealt with but also upon the experience, skill and judgment of the surgeon, together with the hospital organization. By recognition of all these factors not only will the mortality attain a minimum but, what is equally important, the morbidity. While experience will not always produce an ace resectionist certainly one cannot become accomplished until

he has performed at least 50 such operations. All in all, provided the urologist is skilled in the procedure to be adopted, there should be no difference in the mortality rate in a given type of case, whether the patient undergoes a resection or an enucleation. On the other hand resection in the hands of unskilled men has certainly shown a higher mortality than prostatectomy, even excluding the numerous major accidents with ensuing dire complications in resected patients who did not die.

One of the outstanding claims for resection has been the short period of hospitalization. This is often true, but equally often persistent infection, the need for repeated resections, or the occurrence of secondary hæmorrhages, have prolonged the period beyond that for prostatectomy. After all, the possibility of shortening the period of hospitalization as compared to the certainty of cure should not influence the decision.

The author's main indictment against resection is its use in large hypertrophies where results are unreliable and persistent morbidity is frequent; and in the group of patients with only slight hypertrophy and small residual urine where there is no real indication for any operation and where resection is followed by a great deal of urinary irritation. Many statistical figures include a large percentage of these latter cases in which there should be no mortality.

Resection is the procedure of choice and gives good results in (1) sclerotic prostates; (2) median lobe hypertrophies, (3) limited hypertrophies, (4) carcinomas, (5) post-operative tags and bars, (6) prostatic calculi.

N. E. BERRY

Vaso-orchidostomy with Interposed Spermatocoele: A Procedure for the Treatment of Sterility. Wilhelm, S. F., *Arch. Surg.*, 1935, 30: 967.

The purpose of this operation is to form a spermatocoele, as the likelihood of success is thus increased. The operation is performed in two stages. First a funnel-shaped sac lined with epithelium is formed to unite the tubules of the epididymis or rete testis to the divided end of the vas. This is done by making a permanent vasostomy, leaving the skin edges apart to permit the formation of an area of soft hairless epithelium. The next step is the dissection of the vas and a cuff of skin. The epididymis is then aspirated for sperm; if found, it is freely incised. If sperm is not found the epididymis is removed and the rete cut across. All bleeding is controlled and the umbrella of skin with the vas is sutured around at some distance from the opening in the epididymis or in the cut rete. Great care is taken not to injure the testis and the operation is completed without drainage.

N. E. BERRY

Anæsthesia

Postanæsthetic Headache. Harrison, P. W., *Arch. Surg.*, 32, 1: 99.

The author has had considerable experience with spinal anæsthesia in Arabia where in addition to the ordinary hospital patient it is frequently used on patients who wish to walk home afterward. Ordinarily a great many patients did not suffer from spinal headache if they remained recumbent after the operation, but there was still an appreciable number who did. Those who sat up or walked around almost invariably suffered from severe and persistent headache. With a view to preventing this, several interesting investigations were carried out.

Realizing that the irritating nature of the drug used was responsible for a large percentage of the headaches, the author devised a solution of procaine hydrochloride, of a concentration of 5.48 per cent, which is isotonic with spinal fluid. To this was added calcium chloride in a quantity sufficient to make the strength 0.024 per cent. The pH of the solution was set between 7 and 7.2. This solution affords an anæsthesia lasting from one hour to one hour and a quarter. The improved anæsthetic solution alone gave a great improvement in the number of postanæsthetic headaches, but the case of the ambulant patient was not yet solved.

The uniform appearance of headaches *immediately after* the disappearance of the anæsthesia suggested a vasomotor reaction in the vessels of the meninges and cord which involved some disturbance in cerebrospinal hydrostatics. The vessels shrink in volume and there is a slight increase in the space to be occupied by the spinal fluid and as a result a slight drop in the intracranial pressure. This is accompanied by increased absorption of spinal fluid from the subarachnoid space and as a result headache occurs.

Finally the author began the intravenous injection of 4 ounces of 5 per cent dextrose in physiologic saline solution immediately following the operation. The slight hydræmia which the dextrose solution induces is sufficient to check the excessive absorption until recovery or compensation can take place, thereby reducing the disturbance in cerebrospinal hydrodynamics to so low a level that headache does not occur. The results, in ambulatory patients in particular, have been most gratifying.

ARTHUR WILKINSON

Therapeutics

Tiger-Snake Venom in the Treatment of Accessible Hæmorrhage. Rosenfeld, S. and Lenke, S. E., *Am. J. M. Sc.*, 1935, 190: 779.

The authors have successfully employed the venom of the Australian tiger-snake (*Notechis*

scutatus) for the stopping of hæmorrhage from accessible lesions in various blood dyscrasias. The venom of this reptile will produce a very marked increase in the rapidity of clotting *in vitro* in many hæmorrhagic diseases, such as leukæmia, purpura hæmorrhagica, hæmophilia, etc.

Clinically the venom, in 1:5,000 dilution, applied on cotton pledgets to accessible bleeding surfaces, will produce local hæmostasis in from one to five minutes. In 8 cases, including thrombocytopenic purpura, hæmophilia, and leukæmia, this method produced rapid local hæmostasis where other hæmostatics such as thromboplastin, tannic acid, adrenalin, and ferric chloride, failed. However, it did not prevent the recurrence of hæmorrhages or otherwise affect the course of the disease. In no instance was there evidence that the neurotoxin of the venom did any damage. Even in patients who received 15 to 30 c.c. of 1 in 5,000 solution orally or intranasally no impairment of the cranial nerves or muscular weakness was noted. The authors point out that the drug is suitable for local applications only, and is not to be confused with moccasin snake venom, which is given intradermally or subcutaneously.

E. S. MILLS

Theophylline in the Treatment of Disease of the Coronary Arteries. Smith, F. M., Rathe, H. W. and Paul, W. D.: *Arch. Int. Med.*, 1935, 56: 1250.

The authors report their experience, covering a period of eight years, with the use of theophylline and theophylline ethylenediamine in the treatment of disease of the coronary arteries manifested by congestive failure, paroxysmal dyspnoea, angina on effort and coronary occlusion. Four cases are reported, illustrating the action of theophylline in the treatment of congestive failure due to disease of the coronary arteries. The action of the drug is prompt and generally evident in all cases in which it is possible to restore the cardiac function, provided the work of the heart is reduced to the minimum through absolute rest in bed, relaxation and sleep. Their treatment consisted of rest in bed, a cardiac diet, liquid petrolatum, $\frac{1}{2}$ grain of phenobarbital after meals and at bedtime, and $\frac{1}{4}$ grain of morphine sulphate when required for sleep. Theophylline ethylenediamine, $1\frac{1}{2}$ to 3 grains, three times a day was added. In some cases, digitalis was prescribed in conjunction with the theophylline.

They report favourable results in 72 of 110 cases of paroxysmal dyspnoea, angina on effort and occlusion of the coronary arteries. They recommend that theophylline be prescribed as soon as the diagnosis of disease of the coronary arteries is established, and that its administration be continued over a long period of time, in

order to insure the maximum benefit. They stress however, that this constitutes only one measure in treatment and should not be employed to the exclusion of other established means of restoring cardiac function.

LEYLAND J. ADAMS

A Contribution to the Treatment of Burns.

Turner, A. C., *Brit. M. J.*, 1935, 2: 995.

While the tannic acid treatment of burns was a great advance over older methods it is possessed of certain disadvantages. In the first place, the coagulum formed is coarse, tough and not transparent. Pus formation is difficult to diagnose and may spread over a large area without perforating the scab; hence much young epithelium may be destroyed. Moreover, granulation tissue under a bed of pus is always coarse and scarring is produced. It would seem desirable then that a drug giving a thin, transparent scab be used if possible. Another disadvantage of tannic acid is its destructive action on the bed clothes; if these are protected with rubber, the burned parts in contact do not do well because of the hindrance to free ventilation. Moreover, tannic acid is unstable in watery solution, making its use cumbersome in first aid or hospital practice.

After experimentation, the author found that mercurochrome in 2 per cent watery solution was not only possessed of strong antiseptic properties but when applied to the freshly burned surface was successful in causing the formation of a thin, semi-transparent crust. This drug is indefinitely stable in solution, does not precipitate protein, and is non-irritant to the tissues. A final advantage is that epithelialization under the scab takes place rapidly.

The author has now used the mercurochrome treatment extensively for over a year with excellent results. His technique is as follows. No general anæsthetic is used; large doses of opiates are given. All dead tissue is stripped from the burned area and all foreign matter removed. Cleansing is effected with normal saline at 100°. The area is then swabbed over with a 2 per cent aqueous solution of mercurochrome and is immediately dried with an electric drier. The first day, four applications are used, the second, three, and the third, two. The burned areas are always freely exposed to the atmosphere. If pus forms, it is readily seen, is evacuated, the area cleansed with saline, and mercurochrome reapplied. The author claims less general reaction during convalescence, a minimum of pain and discomfort, no toxic effects, and little scarring.

W. FORD CONNELL

Pathology and Experimental Medicine

Effect of Theophylline Ethylenediamine on Experimentally Induced Cardiac Infarction in the Dog. Fowler, W. M., Hurevitz, H. M. and Smith, F. M., *Arch. Int. Med.*, 1935, 56: 1242.

The authors report experiments on the effect produced by theophylline ethylenediamine (euphyllin) upon the coronary arteries.

A comparison of the various drugs used in perfusion of the isolated heart of the rabbit, revealed the vast superiority of theophylline ethylenediamine in augmenting of the coronary flow. The immediate effects of the drug were studied in six dogs. After exposing the heart, the anterior descending branch of the left coronary artery, together with the accompanying vein, was ligated just above the origin of the last main branch. Almost immediately an area of cyanosis appeared distal to the ligation. This gradually increased in size and reached its maximum extent in about five minutes. Two c.c. (0.48 g.) of theophylline ethylenediamine were injected intravenously, with striking regression of the area of cyanosis. The extent to which the cyanosed area disappeared varied from animal to animal, but from 50 to 90 per cent of the cyanosed area was restored to normal colour in each instance and became indistinguishable from the uninvolved area.

The late effects of the drug were studied in nineteen dogs. Three weeks after ligation of the anterior descending branch of the left coronary artery, just distal to the origin of the last main branch, the hearts were examined at autopsy. The first ten of these animals served as controls, whereas the remaining nine had been given theophylline ethylenediamine orally, 3 grains (0.195 g.) daily after the operation. The area of fibrosis was markedly diminished in the latter group.

The authors believe the changes observed both as to early and as to late effects were dependent on the action of the drug upon the collateral circulation. They recommend the use of theophylline ethylenediamine in the treatment of acute coronary occlusion in human beings.

LEYLAND J. ADAMS

The Sterols, Sex Hormones and Cancer. Bourne, G., *J. Cancer Res. Comm. Univ. of Sydney*, 1935, 7: 34.

The author has published this paper on the study of cancer in the hope of arousing interest in the epoch-making researches of Dodds, Kenaway and Cook into the relationship between sterol metabolism of the body and the development of cancerous growths. The last-mentioned investigators, during the past two or three years, have succeeded in isolating from coal tar a number of substances capable of causing the de-

velopment of cancerous growths. They have established the general chemical characters of these substances as those of a sterol. They belong to the same great group as the male sex hormone (androkynin), the female sex hormone (œstrin), vitamin D, cholesterol, and the bile acids. This curious chemical coincidence is almost certainly of profound significance to the study of the cancer problem. Bourne discusses the possible relationships of the carcinogenetic principle to sex sterol metabolism. He suggests as a working hypothesis to guide further study that there is a carcinogenetic principle circulating in the body, as well as a localized area of capillary stasis. The carcinogenetic principle will accumulate around this area (as a result of the blockage) and gradually increase in concentration. Once this concentration has passed a certain minimum the tissue reaction will be such that a tumour growth will be initiated. In sterol metabolism probably lies the secret of all cancerous growths. To explain why we sometimes get a metaplasia of an adult tissue into one of a different kind he cites the discovery by certain workers at Cambridge of "organizers", substances of the nature of sterol, which, when applied to a developing ovum, can persuade practically any organ to grow in practically any position in the embryo. Consequently, local aberration in sterol metabolism may lead to tissue metaplasia. Studies are to be carried out to test the validity of this conception.

JOHN NICHOLLS

The Hinton Test. Its Clinical Value. Cheever, A. W., *New Eng. J. Med.*, 1936, 3: 112.

Those who have been dealing with syphilis for a number of years have come to realize the inadequacies of the Wassermann test. In the latent and the late stages it fails in a fairly high percentage of cases. The greater delicacy of the Hinton test is not achieved at the expense of dependability, for false positive Hintons are fewer in number than false positive Wassermans or Kahns.

The author reports a series of 143 cases in which the Wassermann, Kahn, and Hinton tests were made simultaneously. The Wassermann test, with only 19 positives, fell far behind the Hinton, which showed 67 positive reactions. The Kahn test gave 34 positives.

When the Hinton test first became available the question was raised as to whether the increased delicacy would not be accompanied by a great increase in the number of false positives. Mudge found one false positive in a group of 750 positive Hintons.

In detecting unsuspected syphilis in a group of approximately 5,000 cases of cancer, tuberculosis and pregnancy, the Hinton test was found to be twice as efficacious as the Wassermann.

MILLIAN A. CARR

Obituaries

Dr. Ross Livingston Blackadar, of Port Maitland, N.S., suffering from a spinal injury, was admitted to the Yarmouth Hospital in the latter part of December, 1935. This injury resulted from an accident a year ago when his automobile overturned. On January 10th he died from a heart attack. Dr. Blackadar was a graduate in Medicine of Dalhousie University (1902) and had practised for many years at Port Maitland. He served for a time as Medical Officer of Health of Yarmouth. He was sixty-one years of age at the time of his death. He is survived by his wife, one son, one daughter, and three brothers.

Dr. J. A. Gadbois, of Outremont, Que., died suddenly on February 26, 1936, at his home, aged 90. He was born at St. Antoine-sur-Richelieu, Que., studied at St. Hyacinthe Seminary, and practised medicine at St. Marc du Richelieu, Sherrington, and finally in Montreal. He is survived by four daughters, Mrs. Napoleon Archambault, Mrs. Oswald Mayrand, Mrs. J. H. Albert Bohemier and Mrs. Gregoire Girard, all of Montreal.

Dr. Frederick William Hill, a well-known member of the medical profession of the Belleville district, who had been residing in Ottawa for the past five years, died on February 25, 1936. He was a graduate of Trinity University (1903). He is survived by his widow, formerly Lulu White, and three sisters, Mrs. W. H. Murphy, of Ottawa; Mrs. R. M. Arbuthnot, Beaverbrook, Ont., and Mrs. W. F. Sawyer, of Vineland, N.J.

Dr. Robert Carroll Hiscock, of Kingston, Ont., died on January 20, 1936. He was born in 1875 and was a graduate of Queen's University (1900).

Dr. Lewis Wilkinson Johnstone, of Sydney Mines, N.S., died on March 9, 1936, from burns, after a distressing accident. He was 76 years of age.

Dr. Johnstone was born at Sydney, N.S., and was a graduate of the University of King's College, and, in Medicine, of Bellevue Hospital Medical College (1886). He was a member of a family long distinguished in Nova Scotia, both his grandfathers being Judges of the Supreme Court of Nova Scotia.

Dr. Johnstone began practice in Sydney Mines and remained there the rest of his life, taking an active interest in community affairs. He was a town councillor for several years and later mayor of Sydney Mines. Dr. Johnstone represented the constituency of Cape Breton-North Victoria at Ottawa in the Conservative interest, in the terms following the general elections of 1925, 1926 and 1930. He was defeated in 1935.

Dr. Major Henry Langs, of Hamilton, Ont., died on February 29, 1936, in his sixty-seventh year. He had been in failing health for some months and was critically ill since December. Of pioneer stock, being a great grandson of Elizabeth Gage, late of Battlefield House, Stoney Creek, Dr. Langs was born in Langford, Ont., coming to Hamilton in 1904, the year following his graduation from Toronto University.

Surviving, besides his wife, the former Miss Nellie Rothwell, are one son, Dr. E. R. Langs, of Lynden; and three daughters, Misses Helen, Isobel and Florence, at home.

Dr. Frederick Henry Kalbfleisch, of Kitchener, Ont., died on December 13, 1935. He was born in 1865 and a graduate of the Medical Faculty of Trinity University (1888).

IN KEEPING WITH THE TIMES

Since our laboratories presented Emmenin Collip in 1930 the endocrines have been established as a highly important and growing field for medical endeavour. The marked effect of pituitary substances in a great variety of disorders has been well demonstrated in the mass of clinical data now available, but it is only recently that any of the individual factors of the anterior hypophysis have been successfully prepared. In keeping with the trend of glandular therapy we now offer several of these factors of the anterior hypophysis.

Excepting as otherwise described, sterile solutions of the following anterior hypophyseal factors are prepared and standardized in accordance with the technique of Dr. J. B. Collip, Department of Biochemistry, McGill University. All these solutions are prepared for subcutaneous or intramuscular injection.

Polyansyn

Indications—Conditions such as Simmonds' disease or general hypofunction of the anterior hypophysis; also, post-operatively in some cases following the removal of hypophyseal tumours.

Prolactin (lactogenic factor)

A sterile solution of the lactogenic factor of the anterior hypophysis, prepared in accordance with the technique of Drs. Oscar Riddle and Robert W. Bates.

(*J. Pharmacol. & Exp. Therapeutics*, 55: 365, 1935).

Indications—To stimulate lactation in the presence of a developed mammary tree.

Maturity Factors (gonadotropic)

Indications—Amenorrhœa, sterility, cryptorchidism (undescended testes) and infantilism.

Thyreotropic Factor

Indications—non-myxœdematous hypothyroidism and myxœdema.

Adrenotropic Factor

Indications—Owing to its effect in restoring towards normal the cortex of the atrophic adrenal of the hypophysectomized animal, cases of hypo-adrenalism may be benefited by the trophic influence of this factor, particularly when pituitary hypofunction exists.



AYERST, McKENNA & HARRISON LIMITED

Biological and Pharmaceutical Chemists

MONTREAL

CANADA

News Items

Alberta

The first session of the Legislature under the Social Credit Government of Alberta opened in February, and, while it is planned to last a short time only, many important measures and amendments are forecast. The question of Unemployment Relief is to be cared for under a special Commissioner, and provision is made to prohibit people travelling from where they are residents, and provision has been made for their care in other municipalities. The Act provides that a recipient of unemployment relief shall not be deemed to be an indigent, and limits the liability of the municipality to such recipient to medical care and treatment when sick, if he is, in fact, an indigent. To the average layman the Act is not readily understandable, as Clause 12 herewith will indicate:

"12. In case provision is made at any time the Government of the Province or by the Government of Canada or by both, for the relief of unemployment, whereby assistance is afforded to a municipality, in defraying the cost of providing such relief for any period, then in each such case and during any such period,—

- (a) Any person who is afforded unemployment relief, shall be deemed not to be an indigent person for the purpose of any Act governing any municipality;
- (b) The liability of a municipality to any person who is by this Act qualified to receive unemployment relief, and who but for this part would have been an indigent person, shall be as provided in this part;
- (c) The fact that a person is in receipt of unemployment relief shall not affect the duty of a municipality under the Act governing that municipality, to make provision for the care and treatment of such person, if he is in fact indigent and is sick."

The Liquor Act is being amended to provide for the Government handling the distribution of beer, and provision is made whereby men can be interdicted for other than family reasons. Persons now may be interdicted who by excessive drinking endanger the welfare, life or health of any person to whom they owe a duty. Whether excessive drinking will be interpreted by the Court after the finding of the Special Commission in Great Britain remains to be seen.

Some twenty-five or thirty years ago an attempt was made to raise a fund to establish a hospital at Fort Saskatchewan. Over \$5,000 was raised, but the project was never completed. Provision is made now whereby this fund is transferred to an Edmonton hospital, which will invest it and use the interest towards paying the cost of the hospitalization of the town's indigents.

Certain new provisions are made regarding the responsibility for notifying coroners. They are as follows:

- "(1) Where upon the death of any person any medical practitioner, any undertaker, any embalmer, any inmate of the house in which the deceased resided, immediately before his death, and any peace officer, has reason to suspect or believe that such person died either: (a) an unnatural death; or (b) a sudden death of which the cause is unknown; or (c) as a result of violence; or (d) as the result of any wrongful act or omission on the part of any other person; or (e) in such place or under such circumstances that the hold-

ings of an investigation is necessary pursuant to the provisions of any statute of the Province, he shall immediately notify the Coroner having jurisdiction in the place where the body of the deceased person is of the facts and circumstances relating to the death."

Dr. J. E. Macklin, of Calgary, has returned from a two months' absence in New Orleans and Chicago, which were spent in post-graduate work in gynaecology and urology.

The annual banquet of the Calgary Medical Society, was held on February 11th, at the Renfrew Club, with Dr. F. T. Campbell presiding. Among the guests were Dr. Gordon Gray, President of the Edmonton Academy of Medicine and Dr. Roy Thorpe, President of the Calgary Dental Society. The guest speaker was Mr. J. H. Blackstock, K.C., of Medicine Hat, who gave an eloquent address on "Where are we drifting to?" This was an estimate of present world tendencies and the part Canada is taking.

G. E. LEARMONTH

British Columbia

The Provincial Government's Health Insurance measure, while not the principal plank in the Liberal Party's platform which it has been claimed to be, continues its course through the caucus as a centre of heated controversy and excitement. Although those chiefly concerned in devising it have been actively engaged for some months past in bringing it before the public, by means of radio broadcasts, addresses to women's organizations and other such bodies, the general public has manifested very little concern over it. In fact, it is believed that the great majority of the people in everyday life know and care very little about the matter. Except by organized bodies, such as the Canadian Manufacturers' Association, British Columbia Loggers, chiropractors, an occasional newspaper editorial, and amongst the members of the medical profession, no opposing comment is encountered, either in the press or heard in conversation. Favourable comment or active support has been practically altogether that appearing in published reports of the speakers to public bodies above referred to.

Mr. Gordon Wismer, Liberal member for Vancouver Centre, is dissatisfied as to what the public's wishes in the matter may be, and feels that on a matter of such importance, affecting over half the population in a most direct fashion, the public should have a right to decide upon the desirability of the Health Insurance program. He therefore has proposed that the decision be made by a general provincial plebiscite. The Hon. G. M. Weir, on the other hand, is determined to push ahead with his program and qualifies his colleague's suggestion as ludicrous and a good stalling device.

A delegation of eighteen from Vancouver, representing the Canadian Manufacturers' Association (B.C. Division), Shipping Federation of British Columbia, Building and Construction Industries Exchange, Vancouver General Contractors' Association, British Columbia Lumber and Shingle Manufacturers' Association, Mining Association of British Columbia, British Columbia Loggers' Association, Vancouver Board of Trade, Canadian Pacific and Canadian National Railways, appeared to protest vigorously against the proposed enactment to Premier Patullo. They offered to supply funds for an actuarial survey if action was postponed until next year. Dr. Weir's comment upon this was that two leading actuaries of Toronto and Montreal had independently passed favourable judgments on the scheme, and that the offer was therefore superfluous, and another example of a stalling device.

In moving the address in reply to the speech from the throne at the opening of the Legislature, Mrs. Paul

When Cardiac Disease Is Suspected

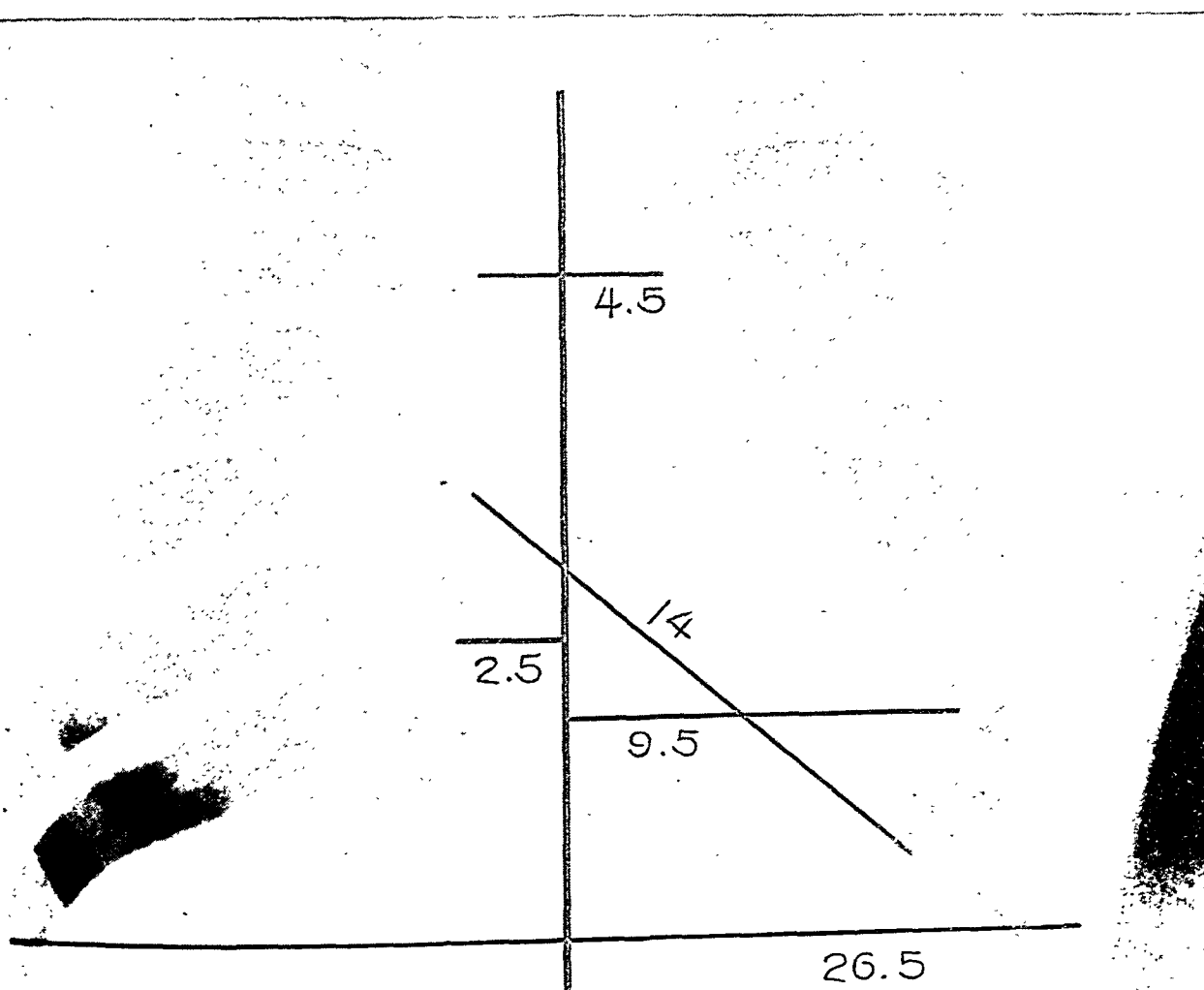
IN many cases where symptoms suggest cardiac disease, accuracy of conclusions cannot always be assumed if they are based on clinical findings alone. Yet positive diagnosis and prompt treatment are necessary to conserve the patient's health and life.

A radiographic study should be a part of the examining routine. The heart's silhouette, as shown by the radiograph, is a reliable index to its

condition. For the heart's size and shape usually are directly affected by its anatomical and functional status.

Thus, radiography aids in determining pathology and is equally valuable as a means of excluding heart disease if not present even though symptoms may point to it. To be certain your findings are complete and accurate, refer the patient to a radiologist in all cases of suspected cardiac disease.

CANADIAN KODAK CO., LIMITED, Toronto, Ontario



**Radiographs Provide
Diagnostic Facts**

Smith, Liberal member for Burrard, spoke strongly in support of the Health Insurance legislation, characterizing its opponents as those who apparently are more ready to pay for jails, asylums and hospitals for the incurable than for the education and early treatment that would have made such institutions largely unnecessary.

It is understood that solid support of the measure by the C.C.F. opposition is counted upon.

In the meantime, while it has been generally understood that the proposed Act, as first presented in the draft which was circulated some months ago, has undergone extensive modification, including reduction of the income level for beneficiaries to \$1,800 per annum, and removal of all provisions for indigents, it had been impossible to obtain from the government any information as to the nature of the Act which will be submitted to the legislators at the opening of the session. This has been the case in spite of requests from the Health Insurance Committee of the College of Physicians and Surgeons, which very properly claim that it is unreasonable of the government to expect cooperation on the part of the profession in a matter on which they have been denied any specific information.

The opportunity of securing this information did not occur until after the opening of the session. When it was received it was at once carefully studied by the Health Insurance Committee. The result of this examination of the bill was the despatch of a telegram to every member of the profession in the province, stating that the bill was considered absolutely unsatisfactory, and requesting each member to telegraph the Premier and his local member at once, protesting passage of the bill.

At the time of writing the fate of the bill is still uncertain, but that it will have a stormy passage through its various stages is certain.

Dr. G. F. Amyot, Medical Health Officer for North Vancouver, has been appointed by the government as a special investigator to consider the future of hospitalization in the Province. The brief and unexplanatory statement from the Provincial Secretary, Hon. Dr. G. M. Weir, was as follows: "There are many problems in connection with the relation between the hospitals and the Provincial Government, and Dr. Amyot is being asked to investigate the situation and to report his findings."

On February 28th a medical delegation, including Dr. Bazin, of Montreal, Professor of Surgery at McGill, and Dr. T. C. Routley, General Secretary of the Canadian Medical Association, and Drs. J. J. Gillis and W. H. Sutherland, the two latter being members of the Provincial Legislature, appeared before the Cabinet, declaring that the government's proposed health insurance measure was unsound from both the actuarial and medical standpoint. At the same time telegrams by the hundred poured in from all parts of the province to ministers and members. It was stated by one of the latter that the vast majority were downright attacks on the plan. *The Vancouver Province* of February 28th stated that in spite of this "it was indicated that the government had not altered its plan to press its health insurance bill to adoption before the House adjourned".

Dr. W. H. Walsh, of Chicago, has arrived in Vancouver to conduct a survey of the facilities and general conditions of operating the Vancouver General Hospital. His appointment was made for the purpose by the Hospital Board of Directors. Dr. Walsh is considered one of the outstanding hospital consultants in the United States, and last year, at the invitation of the Russian Government, he spent three months in Russia investigating conditions in hospitals, medical schools and health services.

Approximately 600 employees of the Comox Logging Company have made a health and medical attendance agreement with two physicians of Courtenay and St. Joseph's Hospital of Comox, with the logging company of course making a substantial contribution. Employees with resident dependents pay \$1.00 monthly, the service being available also for these dependents; while workmen with no dependents pay \$2.00 per month. Benefits of this scheme are extended to widows and children of men who die during the term of the agreement.

D. E. H. CLEVELAND

Manitoba

The following additions have been made to the Honorary Attending Staff of the Winnipeg General Hospital: to be Assistant Dermatologists: W. Geo. Black, B.A., M.D. and A. R. Birt, M.D.; to be Assistant Urologists: J. L. Wiseman, M.D. and C. B. Stewart, M.D., F.R.C.S. (Edin.).

Thirty-seven members of the Faculty of Medicine, University of Manitoba, paid a good-will visit to the sister Faculty of the University of Minnesota on February 21st and 22nd. On the morning of the first day conferences were held in Willard, presided over by Dean Lyon, when a number of teaching problems were considered, notably examinations, student health services, and correlations clinics to the Freshman and Sophomore years. Following this a lunch was served at the Union on the University grounds when the men had an opportunity to meet their opposite numbers. In the afternoon tea was served in the Nurses' Home of the University Hospital and in the evening there was a seminar. The second day was devoted to visits to hospitals and museums. The general feeling was that the tour had been distinctly worth while and it is hoped that a return visit can be arranged next year.

The post-graduate course in Gastro-enterology has been well attended and some of those present have come from points at a considerable distance in Saskatchewan. So great was the interest that the registrations exceeded the limit (25) set. The course in Physiology for Winnipeg doctors has also been a distinct success.

ROSS MITCHELL

New Brunswick

Immunization Clinics against Diphtheria are again being carried on under the Provincial Department of Health by Dr. J. M. Cameron, of Fredericton.

At the monthly meeting of the Saint John Medical Society, held at the Admiral Beatty Hotel on February 26th, Dr. H. A. Farris was the speaker. His subject was "Coronary thrombosis". Doctor Farris' remarks were illustrated by a large number of the most excellent cardiographic tracings and x-ray films. The attendance was one of the largest in the history of the Society and once again a considerable number of physicians from outside the city was present.

Dr. J. M. Barry, Saint John, has been appointed Registrar of the New Brunswick Council of Physicians and Surgeons, succeeding the late Dr. S. H. McDonald.

The Association of Officers of the Medical Services of Canada, New Brunswick Branch, at their last meeting, elected officers for the ensuing year as follows: *Honorary President*.—Hon. Murray MacLaren, Lieutenant-Governor of the Province; *Honorary Vice-president*.—Brigadier General Page, Officer Commanding M.D. 7; *President*.—Lieut.-Col. G. G. Corbet, C.A.M.C.; *Vice-president*.—Capt. George Lyons, C.A.M.C., Moncton; *Secretary*.—Capt. H. B. Bustin, C.A.M.C., Saint John.

An Aid In Fighting Chronic Sepsis

MANGANESE

POTASSIUM

PHOSPHORUS

Chronic cholecystitis, chronic prostatitis, chronic colitis are but a few of the rather common conditions which give rise to a state of chronic sepsis.

Fellows' Syrup in these conditions supplies the required mineral elements. The dose suggested is one teaspoonful four times daily, in water.

SAMPLES ON REQUEST

FELLOWS MEDICAL MFG. CO., LTD.

286 St. Paul Street, West, Montreal, Canada.



CALCIUM

SODIUM

IRON

OVOL'S are

SPECIALLY DESIGNED
UNMARKED
UNCOLOURED TABLETS OF
ACETYLSAL. AND COMBINATIONS.

OVOL "APCC"

Acetylsalicylic Acid.....	3½ grs.
Phenacetine.....	2½ grs.
Caffeine Citrate.....	½ gr.
Codeine Phosphate.....	⅛ gr.

OVOL "APC"

Acetylsalicylic Acid.....	3½ grs.
Phenacetine.....	2½ grs.
Caffeine Citrate.....	½ gr.

OVOL "A"

Acetylsalicylic Acid.....	5 grs.
---------------------------	--------

OVOL "APCC2"

Acetylsalicylic Acid.....	3½ grs.
Phenacetine.....	2½ grs.
Caffeine Citrate.....	½ gr.
Codeine Phosphate.....	¼ gr.

No packages for laity demand. In bottles of 100 and 500 Tablets only. Request literature and samples.

Manufactured by

FRANK W. HORNER LIMITED
MONTREAL - - CANADA

At this meeting Lieut.-Col. R. A. Hughes, C.A.M.C., delivered a paper outlining the historical, geographical and military aspects of the Suez Canal.

The Saint John Officers' Garrison Mess and Military Institute elected two physicians to office at their annual meeting recently, namely, Dr. R. A. Hughes, elected President of the New Brunswick Military Institute, and Dr. V. D. Davidson, Vice-President of the Garrison Officers' Mess.

Two well known physicians have recently been confined to the General Hospital in Saint John. Dr. L. M. Curren has been successfully operated upon for colonic obstruction and is reported to be recovering rapidly. Dr. F. T. Dunlop is still seriously ill from a series of heart and lung complications.

The present session of the New Brunswick legislature, which has just opened, will see presented a bill to amend the New Brunswick Medical Act. The amendments will cover various changes that have become necessary due to changing methods of practice and also some changes relating to the registration of medical students and practitioners. The bill will be introduced by Hon. Dr. W. F. Roberts, Minister of Health in the present government.

Dr. C. J. Veniot, President of the New Brunswick Union of Municipalities was the spokesman at a meeting of the Provincial Government recently. This delegation suggested a special tax of 5 per cent on all liquors sold by the New Brunswick Liquor Commission, to be used as a hospitalization fund, so as to relieve the municipalities of some of the burden of hospital costs for the treatment of the poor, especially in cases of tuberculosis.

Dr. J. A. M. Bell was elected President of the Newcastle Branch of the Victorian Order of Nurses.

Dr. F. H. Wetmore, of Hampton, has been confined to his home for some time by illness. It is reported that his condition is satisfactory.

A. STANLEY KIRKLAND

Nova Scotia

Many charities, including the Salvation Army, Victorian Order of Nurses, I.O.D.E., and health authorities, benefit by the will of the late Dr. F. E. Lawlor, late Superintendent of the Nova Scotia Hospital of Dartmouth.

Dr. J. J. McRitchie, of the Provincial Department of Health, is at present on an extended visit to upper Canadian institutions to study the latest methods of tuberculosis control and clinical work. The purpose of his visit has been explained as follows: "to see what other hospitals and health departments are doing." He will visit Ottawa, afterwards proceeding to London, Muskoka, Hamilton, and other places where tuberculosis institutions are situated.

Dr. Lewis Johnstone, former member of the House of Commons for Cape Breton, North Victoria, suffered a stroke which paralyzed his right side. He was 76 years of age. Reports indicated that he was improving but, through an unfortunate accident, he died subsequently from burns.

Dr. D. A. MacLeod, of Sydney, who had been appointed District Pensions Medical Examiner some months ago, has been relieved of his duties. His services as medical adviser to the Sydney and Glace Bay units of the Royal Canadian Mounted Police have also been discontinued.

Dr. Geoffrey Morris, eldest son of Dr. C. H. Morris, of Windsor, died from pneumonia at Globe, Arizona. He was a member of the Gila County Health Unit of the Arizona State Public Health Department. Dr. Morris graduated from Dalhousie University in 1928.

Two physicians who were born in Nova Scotia but who practised abroad died recently. One, Dr. E. J. Torey, a native of Guysborough Co., died at Albany, and Dr. W. F. Fullerton died at St. Paul, Minnesota, where he had been in practice for many years.

Dr. J. S. Robertson a member of the medical staff of the Nova Scotia Sanatorium at Kentville for the past eighteen months has retired from his post to engage in private practice at Port Hawkesbury.

N. B. DREYER

Ontario

On and after March 1, 1936, *bona fide* relief recipients receiving medical care will have any necessary prescriptions filled by a druggist, whose account will be paid from the funds of the Medical Relief Committee through the Ontario Retail Druggists' Association. Under present relief regulations, such funds will be payable to the Ontario Retail Druggists' Association from the Ontario Medical Association through the deduction of 4c. out of each 25c. per person per month received from the Provincial Welfare Department.

The following changes are announced in the Ontario Hospital Service.

Dr. T. D. Cumberland, superintendent, Kingston, to be superintendent at New Toronto; Dr. A. J. Kilgour, acting superintendent, New Toronto, to be superintendent, Kingston; Dr. C. H. McCuaig, senior assistant physician, Toronto Psychiatric Hospital, granted leave of absence to undertake post-graduate studies abroad on a recently acquired fellowship; Dr. S. C. Chalk, senior assistant physician, Ontario Hospital, London, transferred to Toronto Psychiatric Hospital, replacing Dr. McCuaig.

The Fort William Industrial Farm, under the Ontario Reformatory and Prisons Branch, is to be made a mental hospital for northern and northwestern Ontario. Transfer of the Industrial Farm Buildings from the Provincial Secretary's Department to the Department of Health "kills two provincial problems with one stone". The low reformatory population has made operation of the farm difficult. The Department of Health on the other hand is under pressure to provide more mental hospital space, particularly in the north. Dr. J. H. Senn will be Superintendent of the new hospital.

J. H. ELLIOTT

Saskatchewan

During the evening when the medical staff of the Regina General Hospital discussed "Obstetrics", the following papers were given: "Reminiscences", Dr. F. Guest; "The kidney of pregnancy", Dr. E. T. French; "Indications for Cæsarean section", Dr. M. A. Currie; "Identical twins", Dr. S. E. Moore. At the meeting devoted to cancer Dr. R. T. Riley spoke on "The pathology of skin cancer", and Dr. C. M. Henry explained its treatment.

"Brain tumours in children" was the topic discussed by Dr. U. Gareau and Dr. Lloyd Brown. Films from a case of agenesis of the corpus callosum were shown by Dr. Brown. This is one of the three cases of this condition to be diagnosed before death. The work in encephalography at the Regina General Hospital helps materially in diagnosing the position of the brain tumours.

MIDY'S PROVEINASE

REGULATOR OF THE VEINOUS CIRCULATION

DISTURBANCES of the MENOPAUSE and at PUBERTY



2 to 4 tablets per day.

MIDY'S PIPERAZINE LABORATORIES, New Birks Bldg. MONTREAL

LABORATORIES MIDY: 67 Avenue de Wagram, Paris 17e. J. EDDE Limited, Montreal, General Agent for CANADA

*Recommended by the
Medical profession*



for DISORDERS OF THE LIVER,
BLADDER AND KIDNEYS,
RHEUMATISM, ARTHRITIS



BOTTLED UNDER GOVERNMENT SUPERVISION AT THE SPRINGS

VICHY Célestins

Sales Agent: HERDT and CHARTON INC.
2027 McGill College Ave., Montreal 11 King Street W., Toronto



F. & R.'s
GENUINE
GLUTEN FLOUR



Guaranteed to comply in all respects to standard
requirements of the U. S. Department of Agriculture.



Manufactured by
THE FARWELL & RHINES CO.
Watertown, N.Y., U.S.A.



Classified Advertisements

SALESMEN, to sell specialized medical Journals. Write
A. W. Volland, the C. V. Mosby Company, 3525 Pine Blvd.,
St. Louis, Missouri.

STENOGRAPHER - SECRETARY, wants position in doc-
tor's office or hospital. Five years' hospital experience. Can
take charge of routine laboratory work and patients; also
accounts. Best references. Reply to Box 242, Canadian Medical
Association Journal, 3640 University Street, Montreal

WANTED.—Practice wanted by young physician. Would
consider small town long locum tenens or assisting established
physician. Toronto graduate, age 27. Would prefer to locate in
Ontario. General hospital experience, special proficiency X-ray
and anaesthesia. References. Apply Box 243, Canadian Medical
Association Journal, 3640 University Street, Montreal.

FOR SALE.—Medical practice, city in Niagara Peninsula.
Ontario. Established twelve years. Owner leaving Province.
Apply Box 239, Canadian Medical Association Journal, 3640
University Street, Montreal.

Dr. Gareau presented a child with Little's disease, aged three years. The labour was precipitate. He said that this condition was more common in twins, premature babies and breech deliveries than in large babies. He warned obstetricians against the use of too many sedatives during labour. LILLIAN A. CHASE

United States

Announcement of the Francis Amory Septennial Prize of the American Academy of Arts and Sciences.

—In compliance with the requirements of a gift under the will of the late Francis Amory, of Beverly, Mass., the American Academy of Arts and Sciences announces the offer of a septennial prize for outstanding work with reference to the alleviation or cure of diseases affecting the human genital organs, to be known as the Francis Amory Septennial Prize. The gift provides a fund, the income of which may be awarded for conspicuously meritorious contributions to the field of knowledge "during the said septennial period next preceding any award thereof, through experiment, study or otherwise . . . in the diseases of the human sexual generative organs in general". The prize may be awarded to any individual or individuals for work of "extraordinary or exceptional merit" in this field.

In case there is work of a quality to warrant it, the first award will be made in 1940. The total amount of money available for this purpose will exceed ten thousand dollars, and may be given in one or more awards. It rests solely within the discretion of the Academy whether an award shall be made at the end of any given seven-year period, and also whether on any occasion the prize shall be awarded to more than a single individual.

While there will be no formal nominations, and no formal essays or treatises will be required, the Committee invites suggestions, which should be made to the Amory Fund Committee, care of the American Academy of Arts and Sciences, 28 Newbury Street, Boston, Mass., U.S.A.

General

The American Medical Association of Vienna announces courses of intensive post-graduate study at Vienna, starting in May. The following subjects will be dealt with (1) otolaryngology; (2) ophthalmology; (3) surgery; (4) gynaecology and obstetrics; (5) internal medicine; (6) neurology and psychiatry.

All lectures will be given in English to graduates in medicine only. Each course will embrace a total of approximately 150 hours and average six hours daily, during a period of six weeks. The intensive post-graduate course in ophthalmology for advanced will last eight weeks and embrace about 215 hours, and in neurology and psychiatry, 225 hours.

The fee for the entire course will be—Austrian Schillings 900 (about \$170.00 at the present rate of exchange) per person, including the membership fee of the American Medical Association of Vienna.

The fee for the advanced course in ophthalmology is—Austrian Schillings 1200 (about \$230.00) per person; the fee for the neurology and psychiatry course is—Austrian Schillings 1030 (about \$200.00) per person. Applications are to be sent to the Secretary, American Medical Association of Vienna, Alserstrasse 9, Vienna, Austria.

A deposit of \$50.00 is to be sent with each application and all applications should be mailed not later than six weeks prior to the beginning of the course in Vienna.

The attention of physicians is directed to the regulations of the University of Vienna that a University certificate will be granted only upon completion of four months' residence and a minimum of 300 hours of instruction. Credit towards the University certificate will be awarded to participants in the intensive post-graduate courses.

Tours start from New York and have been arranged to leave on the following dates. May 6, July 8, September 9, October 21, 1936, and February 10, 1937. The return fares vary from \$303 to \$490 (minimum rate) according to steamer and type of accommodation.

For further detailed information regarding the post-graduate courses communicate with Dr. Warren F. Bernstorff, c/o Compass Travel Bureau, 55 West 42nd Street, New York City.

International Congress of Microbiology.—The second International Congress of Microbiology will be held in London from July 25th to August 1st, under the presidency of Professor J. C. G. Ledingham. The congress will be officially opened on Saturday evening, July 25th, at University College, Gower Street, London, the headquarters of the congress. The program, as provisionally arranged, is divided into eight sections as follows: general biology of microorganisms; viruses and virus diseases in animals and plants; bacteria and fungi in relation to disease in man, animal, and plants; economic bacteriology, soil, dairying, and industrial microbiology; medical, veterinary, and agricultural zoology and parasitology; serology and immunochemistry; microbiological chemistry; specific immunization in the control of human and animal disease. The honorary general secretary of the congress is Dr. R. St. John-Brooks (Lister Institute of Preventive Medicine, Chelsea Bridge Road, London, S.W.1).

Book Reviews

Textbook of Roentgenology. B. J. M. Harrison, M.B., Ch.M., D.M.R.E., F.A.C.R., Director of Department of Roentgenology, Vancouver General Hospital. 826 pages, illustrated. Price \$10.00. Wm. Wood, Baltimore, 1936.

To review a textbook on any medical subject is not always a pleasant or profitable task. The book under review does not fall into the above category. Dr. Harrison has produced a work which covers the field of roentgenology in a masterful manner, and thereby fulfils a long desired want. To the clinician he has given a work which will in concise form acquaint him with those things which he should, but unfortunately does not always, know. With it on his desk there should be no excuse for not understanding what may be expected from a given radiological examination or a therapeutic application of the ray. In other words, the book is capable of rendering valuable assistance provided it is used.

The radiologist will find much to ponder over and perhaps much that he may have overlooked. Written with a broad understanding of pathology, physics, chemistry, and clinical medicine, the author without fatigue to the reader presents a clear background on which the radiologist can base his opinions, either in the diagnostic or therapeutic fields. Nor has he failed to accentuate the care with which such opinions must be rendered.

This book perhaps better than any other elevates the radiologist to the rightful position of consultant. It clearly indicates the necessity of consultation between the clinician and the radiologist at all times, if the interest of the patient is to be kept paramount. This of course again emphasizes the necessity of the radiologist being thoroughly conversant with clinical medicine, physiology, morbid anatomy and pathology; otherwise, his opinion, given without a proper background, is of little value and at times may be disastrous.

It is to be hoped that the author will favour us with other works, perhaps dealing with a less wide field. For his present effort the thanks of all radiologists are due.

Biological Products from the Adrenal Glands

Adrenal Cortical Extract

In the course of extensive research in the Connaught Laboratories on the preparation and properties of Adrenal Cortical Extract, sufficient quantities of this material have been obtained to enable the Laboratories to offer this extract to physicians. Adrenal Cortical Extract contains the active principle of the adrenal cortex and it has proved useful in the treatment of certain cases of Addison's disease. The extract is non-toxic, is free from pressor or depressor substances and is biologically standardized. It is distributed as a sterile solution in bottles containing twenty-five cubic centimetres.

Epinephrine

During the preparation of Adrenal Cortical Extract, Epinephrine is obtained as a separate product. This is the active principle of the adrenal medulla and has, of course, been used for many years to stimulate heart action; to raise the blood-pressure; to relieve attacks of bronchial asthma, etc.

Two strengths of epinephrine solution are available from the Connaught Laboratories:

Epinephrine Hydrochloride Solution 1:1000

Physicians are well acquainted with this concentration of epinephrine. It is a sterile solution provided in bottles, each containing thirty cubic centimetres. The bottles are fitted with a special rubber cap, making possible the withdrawal from time to time of desired amounts without contaminating the rest of the solution.

Epinephrine Hydrochloride Inhalant Solution

(Epinephrine Concentration 1:100)

Recently considerable success has been secured in the alleviation of attacks of bronchial asthma by spraying into the nose or mouth this more concentrated solution of epinephrine. Since only small quantities of this solution are employed it is distributed in bottles containing five cubic centimetres. Each bottle is provided with a dropper fastened into the stopper so that small amounts of the solution may be transferred to the special atomizer used in this type of treatment.

Prices and information relating to the use of these products from the Adrenal Glands will be supplied gladly upon request.

CONNAUGHT LABORATORIES

University of Toronto

TORONTO 5

CANADA

The Medical Treatment of Gallbladder Disease.

Martin E. Rehfuess, M.D., Clinical Professor of Medicine, and Guy M. Nelson, M.D., Instructor of Medicine, Jefferson Medical College, Philadelphia. 465 pages, illustrated. Price \$6.00. W. B. Saunders, London and Philadelphia, 1935.

This is an opportune time for the appearance of a book on the medical treatment of gall bladder disease, as many representative surgeons have recently acknowledged a high percentage of unsatisfactory results following gall bladder surgery, especially in stoneless gall bladders.

The senior author has been long and favourably known for his work on biliary disease. The present volume embodies not only a careful review of the recent literature (with special interest in the contributions of French physicians), but also the results of twenty years' experience in the treatment of gall bladder disease.

The chapter on duodenal drainage is especially interesting; the recovery of cholesterol crystals and calcium bilirubinate pigment from the duodenum means almost always gall stones. The correlation of x-ray findings (the dye being given orally) with the results of duodenal intubation is insisted on. These methods of examination should be repeated at intervals, to check the progress of the case.

In 50 per cent of cases there is a metabolic problem, and, leaning heavily on French investigators, the authors urge a low-cholesterol, low-fat diet, partly in the hope of reducing the cholesterol in the bile and partly to secure rest to the inflamed gall bladder, by avoidance of the stimulating fat. Only in the stasis gall bladder is a fatty diet indicated, and then with caution. In 50 per cent of cases the infective element is prominent, foci in the teeth, tonsils and sinuses, as well as in the bowel, being specially incriminated. These foci are dealt with surgically, if possible, and autogenous vaccines are used with definite success.

Stoneless cholecystitis is the main indication for medical treatment; gall stones, with few exceptions, are considered objects for surgical attention—a view not shared by all physicians.

Much original work is recorded in this book; the views expressed are sane and helpful. But the value of the work is vitiated by the carelessness with which it has been flung together, by the frequent irritating repetitions, and by the gross errors of syntax which disfigure its pages.

The Pneumonokonioses (Silicosis). Literature and Laws of 1934. G. G. Davis, M.D., Associate Clinical Professor of Surgery, Rush Medical College, University of Chicago, E. M. Salmonsén and J. L. Earlywine. 490 pages. Price \$7.50. Chicago Medical Press, Chicago, 1935.

While knowledge of the production of the pneumonokonioses and of their influence on the development of tuberculosis is incomplete, the literature on the subject may be expected to be voluminous.

The legal status of victims of dust-disease and of employers involved with respect to compensation, and the difficulties encountered in the control of the dust hazard, focus attention on these diseases more directly than is the case with comparable causes of mortality. These considerations make of particular interest and value Dr. Davis' plan of collecting previous references and abstracting all relevant literature on the subject as it appears year by year from 1934. Last year, "Pneumonokoniosis (Silicosis), Bibliography and Laws" appeared, containing the reference to date from early times. In the present volume appear abstracts of articles published in 1934.

Granted some acquaintance with the previous literature, this volume indicates in readable form the present position regarding the effects of dust inhalation from medical and legal standpoints, including at some length discussions of papers reporting research work. The

sources are widespread—from the *Chicago Journal of Commerce* to the *Sovetskaya vrachebnaya gazeta* (*Medical Journal of Soviet Russia*). To make some of this material available in the English language has been a task in itself. If it had been practical to separate the medical and legal abstracts in the same volume or preferably in two volumes, its use by practising physicians might have been more general.

The various aspects of the problem, whether medical, chemical, mineralogical, or legal have almost a literature in themselves, necessitating constant reference. This is provided through a detailed subject index. The abstracts are arranged alphabetically under the author's name and numbered with an author index as well, which serves to bring together references to the author's discussion of other contributions.

For those physicians located in or near industrial areas this volume presents an opportunity to keep in touch conveniently with the progress attained in the technical and social measures for the control of one of the most important groups of industrial diseases.

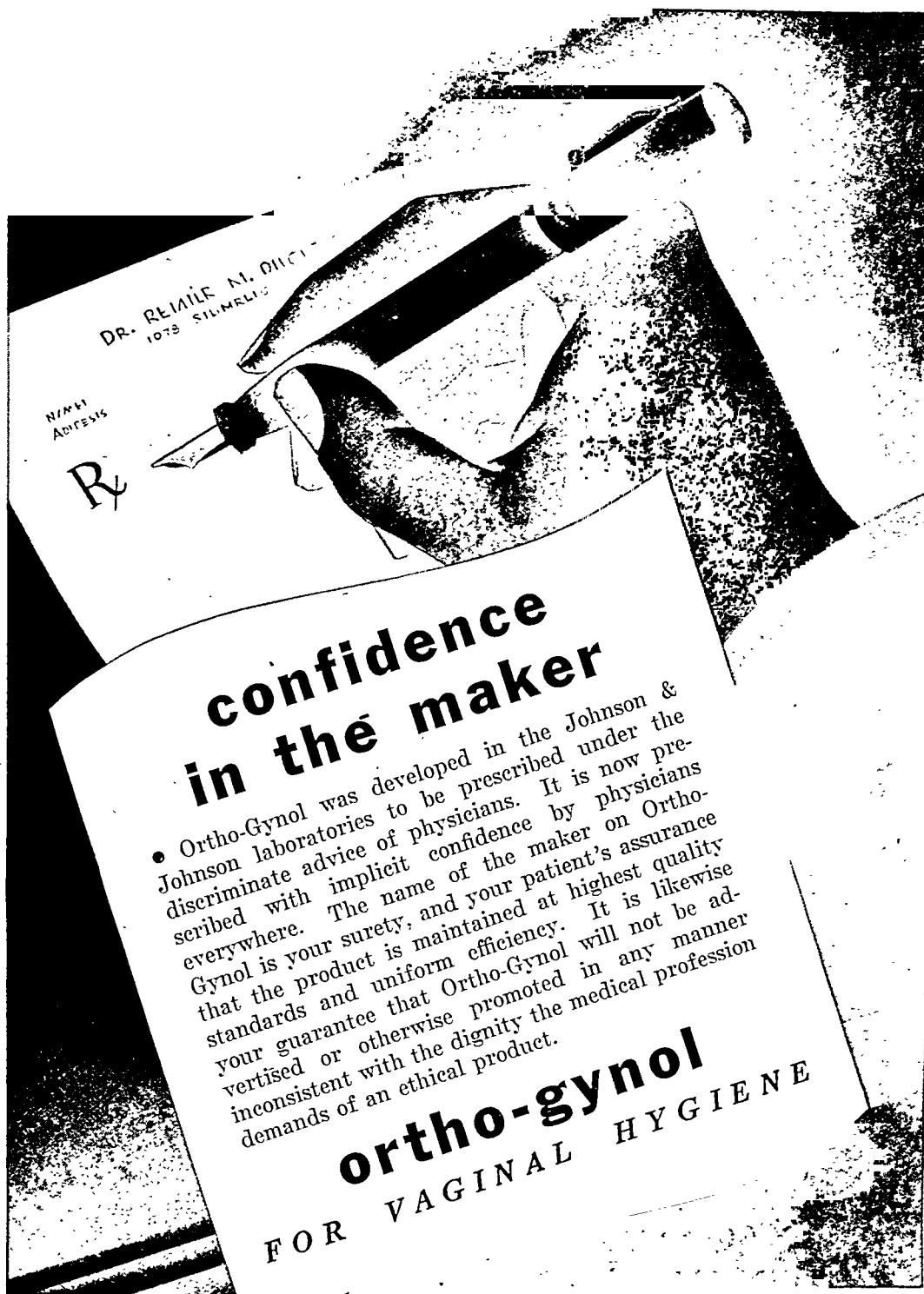
The Modern Treatment of Burns and Scalds. Philip H. Mitchiner, M.D., M.S., F.R.C.S., Hon. Surgeon to H.M. The King. 64 pages, illustrated. Price \$1.50. Baillière, Tindall & Cox, London; Macmillan, Toronto, 1935.

The book deals with a very important subject in the field of surgery. The subject of burns is treated clearly, with emphasis on the tannic acid treatment. While there is moderate reiteration, yet this tends to impress the reader upon certain points the author wishes to bring out. The causes of death from burns are initial shock, collapse and septic intoxication. Methods for the prevention of each are given and special emphasis is laid on the thorough cleansing of the burned area and the neighbouring good skin before the application of the permanent dressing 2 per cent watery solution of tannic acid, freshly made, is recommended and may be applied with a spray or by dressings soaked in the solution.

The print used is good and the illustrations are clear. The work is of value to the practitioner and the physician in charge of industrial concerns.

Forensic Medicine. Douglas J. A. Kerr, M.D., F.R.C.P., D.P.H., Lecturer on Forensic Medicine in the School of Medicine of the Royal Colleges, Edinburgh; Police Surgeon and Medical Referee to the City of Edinburgh. X and 311 pages, illustrated. Price \$4.50. A. & C. Black, Ltd., London; Macmillan, Toronto, 1935.

Forensic medicine is in most colleges the Cinderella of the medical curriculum. It has in the past been taught in a perfunctory way, and even now the average graduate passes out with a very imperfect grounding in the subject. Hence the great value of books such as this. The author has planned his work as a text-book for students and also as a practical modern guide for general practitioners. Its scope is wide and may be judged from an enumeration of the subjects discussed—the ethics of the practice of medicine, the relation of the medical practitioner to the law, the functions of the General Medical Council, the relevant details of British Acts and legal procedure, identification, post-mortems, the examination of blood and hair, accidents, suicide and murder, gunshot wounds and the identification of firearms, abortion, infanticide, sexual offenses, insanity, criminal responsibility, and toxicology. All of these topics are dealt with out of a wealth of experience, lucidly and with circumstance. They are so well discussed that they often possess the interest and allure of the detective story. Worthy of special note is the fact that the book is profusely illustrated, the pictures being taken for the most part from the author's cases, and these pictures elucidate the various topics in a way that no amount of verbal description, even if accurate and vivid,



**confidence
in the maker**

• Ortho-Gynol was developed in the Johnson & Johnson laboratories to be prescribed under the discriminate advice of physicians. It is now prescribed with implicit confidence by physicians everywhere. The name of the maker on Ortho-Gynol is your surety, and your patient's assurance that the product is maintained at highest quality standards and uniform efficiency. It is likewise your guarantee that Ortho-Gynol will not be advertised or otherwise promoted in any manner inconsistent with the dignity the medical profession demands of an ethical product.

ortho-gynol
FOR VAGINAL HYGIENE

A PRODUCT OF

Johnson & Johnson Limited
MONTREAL CANADA

World's Largest Makers of Surgical Dressings

could possibly do. A few criticisms may be permissible. On page 170, under the heading "Examination for Gonococci" surely more instruction should be given. Doubtless, the detection of gonococci calls for the use of the Gram method, but since there are other Gram-negative biscuit-shaped diplococci, some of them non-pathogenic, to be found in the genital tract, it would seem to the reviewer that in cases important enough to call for legal action the diagnosis should be clinched by cultural procedures wherever possible. Under "Poisons" there is no reference to oil of wintergreen, which has been known to cause death when taken in large amounts. The English of the book is not impeccable. Most of the mistakes are those we are familiar with on this side of the water and occur so often that they are a weariness of the spirit to the conscientious editor, but in a book published in Great Britain and, especially, in Edinburgh, we expect better things! However, these are but spots on the sun, and we have no desire to dilate on the subject. The book stands out on its merits as a notable achievement and has distinction quite apart from all this. The legal references are, naturally, concerned with the laws of England and Scotland, but this need not deter a Canadian from buying the book. Many of the principles are of a general character, and, no doubt, are applicable to most modern civilized communities, and the advice given to the medical man as to his duties in medico-legal cases and his relation to the courts is admirable. Such knowledge is absolutely essential. Nowadays, with the quick speed of events and their complicated character no medical man, no matter how far he may be from the great centres, can be sure that he will not be involved, some time or other, in a medico-legal tangle. Most of us need special instruction, and this book will give it us. It is decidedly the best book that we know of on the important subject of forensic medicine.

Practical Biology for Medical Students. C. J. Wallis, M.A., Master-in-Charge of Biology, University College School, Hampstead, London. 247 pages, illustrated. Price \$3.75. Wm. Heinemann, London; Macmillan Co., Toronto, 1936.

This is purely a laboratory manual and dissection-guide; the reader is presumed to learn elsewhere the functions of the structures identified or the significance of the experiments performed. The value of this book must therefore depend largely on the quality of the accompanying instruction. There are sections on the morphology and physiology of plants, but most of the book is devoted to certain animal types selected for dissection (frog, earthworm, rabbit, etc.). Some of these dissections must require much skill and patience if all the structures named in the manual are to be made out; and the student is introduced to a very large number of unfamiliar terms and names, many of them not applicable subsequently in human anatomy and physiology. A selection of elementary exercises in biochemistry is included, chiefly empirical colour reactions. One wonders whether a student understands vitamins the better for having produced a blue colour from cod-liver oil with antimony trichloride. In this section one is surprised to learn that vitamin A is "probably $C_{40}H_{56}$ " and that the violet colour obtained with alkaline copper solution and egg-white is "due to the presence of biuret".

The Design of Experiments. R. A. Fisher, Sc.D., F.R.S., Galton Professor, University of London. 252 pages. Price 12s. 6d. Oliver & Boyd, Edinburgh and London, 1935.

This is a companion piece to the author's well-known and valuable *Statistical Methods for Research Workers*, and describes methods for planning complex experiments so that the data obtained shall be in the most favourable form for statistical analysis. The immediate application is in agricultural research, where

wise planning is of great importance, since experiments usually extend over one or more years. The principles herein set forth (many of them for the first time) are applicable in almost all experimentation on living organisms, and in still wider fields. Familiarity with these principles would lead, in very many experimental laboratories, to economy of time, effort and material, and to increased value of published data. Mathematical complexities are avoided, but the book cannot be called easy reading; it is to be feared that those who most require its guidance are least likely to take pains to master it.

The Extra-pharmacopœia of Martindale and Westcott. Vol. 2 published by Council of Pharmaceutical Society of Great Britain. Twentieth edition, 889 pages. Price 22/6 net. Pharmaceutical Press, London, 1935.

This is the companion volume to the well known Extra-Pharmacopœia. It concerns itself, as of yore, with matters of diagnosis, analysis and assay of materia medica and various other miscellanea not included in the first volume. Every care has been taken to keep the book up to the high standard it has always held.

The "Extra-Pharmacopœia" lost its editor, Dr. W. H. Martindale, in 1933, but it was felt that the work should not be allowed to lapse. It was therefore decided by the Council of the Pharmaceutical Society of Great Britain to take over the responsibility for the production of the book, which has been done and the present volume has been issued under the editorship of Mr. C. E. Cofield, Editor of the British Pharmaceutical Codex. We welcome this admirable arrangement for the continuation of such an excellent work.

The Aims and Methods of Medical Science. John A. Ryle, M.A., M.D., F.R.C.P., Regius Professor of Physic, University of Cambridge. 44 pages. Price 60 cents. Cambridge University Press, 1935.

A thoughtful and well expressed lecture. The author dwells on the evils that may arise from specialization in medicine, and his criticism is temperate. He quotes Hughlings Jackson's remark: "There is no harm in studying a special subject; the harm is in doing any kind of work with a narrow aim and a narrow mind".

Tonsils and Naso-pharyngeal Sepsis. E. A. Peters, M.D., F.R.C.S., President, Otological Section, Royal Society of Medicine. 92 pages. Price \$1.50. Baillière, Tindall & Cox, London; Macmillan Co., Toronto, 1935.

This is a short clear account of the ordinary forms of tonsillar disease and their treatment.

The Integration of the Endocrine System. Sir Walter Langdon Brown, M.D., F.R.C.P. 54 pages. Price 60 cents. Cambridge University Press; Macmillan Co., Toronto, 1935.

This is the Fifth Horsley Memorial Lecture, and was delivered by one pre-eminently fitted to pay tribute to the brilliant work of Sir Victor Horsley.

Aggressive Medicine. John Maberly, M.R.C.S., L.R.C.P. 232 pages. Price \$3.00. Baillière, Tindall & Cox, London; Macmillan Co., Toronto, 1935.

A somewhat startling title, but there is nothing alarming in the contents.

Incompatibility in Prescriptions and How to Avoid It. Thomas Stephenson, D.Sc., Ph.C., F.R.S.E., F.C.S. Editor of *The Prescriber*. Fourth edition, 62 pages. Price 6s. net. The Prescriber Offices, Edinburgh, 1935.

A concise account of the general principles of incompatibility in prescribing, which should be of considerable value to the active practitioner, whether he makes up his own prescriptions or not.

"DUNLOPILLO"

MATTRESSES

"are giving us **SPLENDID SATISFACTION***"*



W. F. HOGARTH M.B. F.R.C.S.
S. D. JEFFREY M.D.
Surgeons

FORT WILLIAM SANATORIUM
FORT WILLIAM, ONTARIO

December 12, 1935.

W. F. HOGARTH M.B. F.R.C.S.
S. D. JEFFREY M.D.
Surgeons

Dur. - Tire & Rubber Goods Co., Limited,
Toronto, Ont.

Dear Sir

The one hundred "DUNLOPILLO" Mattresses, with which our hospital was supplied at the opening in April last, are giving us splendid satisfaction.

From the standpoint of comfort and restfulness, they are probably unequalled. Our Nurses find that they are easier to handle than the ordinary mattress and are particularly well adapted to a patch bed. We have found that they are entirely free from any objectionable odour which might be occasioned by the presence of rubber. The one fact is that the ticking is readily removable and can be washed when desired, makes that particularly adaptable for hospital use.

We would have no hesitation whatever in recommending the "DUNLOPILLO" to any hospital considering the purchase of new mattresses.

Yours very truly,

H. H. Browne
Hon. Secretary-Treasurer,
Fort William Sanatorium.

ays **H. H. BROWNE**

**Hon. Secretary Treasurer of
FORT WILLIAM SANATORIUM**

After a test of nearly one year, the Fort William Sanatorium recommend "DUNLOPILLO" mattresses for hospital use. Like over 80 other hospitals and nursing homes in Canada and England, they have found that "DUNLOPILLO" mattresses, in addition to promoting refreshing sleep, relaxation and comfort for patients, have a practical value that makes them particularly adapted to hospital use.

"DUNLOPILLO" mattresses are substantially germ-proof, do not absorb moisture and, because of their cellular construction and porosity, are always satisfactorily aired. They are permanently resilient and non-puncturable, light, easy to move about and never need shaking up.

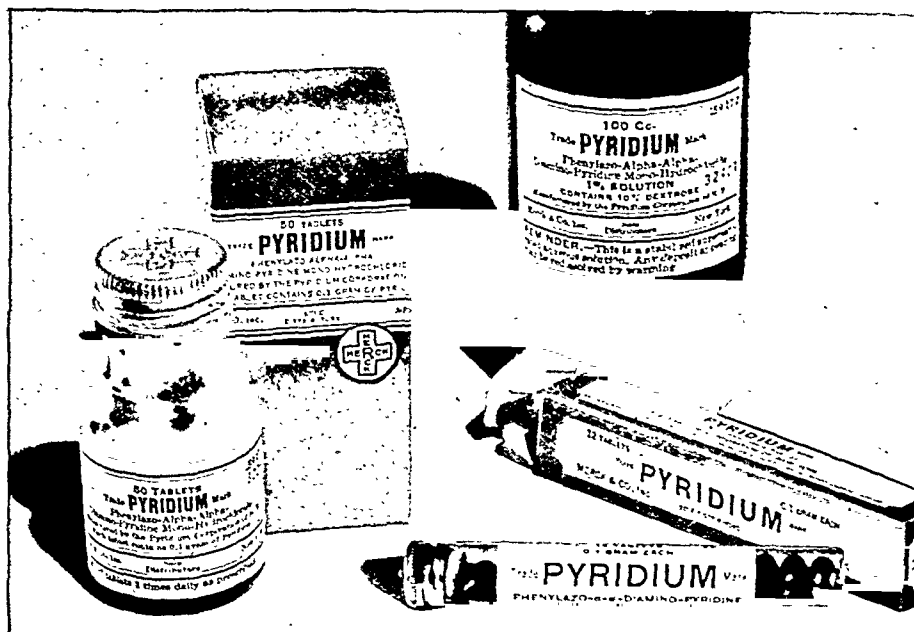
"DUNLOPILLO" CAST PADDING MATERIAL

Soft, resilient, easily and quickly applied; will not wrinkle under cast. Cellular construction allows free air circulation. Dispels discomfort from heat and moisture; overcomes causes of body pressure sores. Insulating qualities prevent condensation between body and cast. Gives patient greater ease, rest, comfort, thus contributing to early convalescence.

"DUNLOPILLO"

MATTRESSES

DUNLOP TIRE & RUBBER GOODS CO., LIMITED



★ PYELITIS ★

Prompt relief of the distressing symptoms which often accompany pyelitis may be obtained by the oral administration of Pyridium. Shortening of the duration of treatment has been reported in many cases. Pyridium is non-toxic and non-irritative in therapeutic doses. Pyridium solution for kidney lavage may be employed effectively with the oral administration of the tablets.

TRADE **P Y R I D I U M** MARK

LITERATURE WILL BE MAILED ON REQUEST

MERCK & CO. LTD. *Manufacturing Chemists* MONTREAL

The general practitioner

now treats . . . **HAY FEVER**

Successfully

HAY FEVER, it is estimated, affects at least two per cent. of the white population of this country. This means that five of each 250 patients seen by the General Practitioner in the course of a year suffer from attacks of Hay Fever in the early summer or fall. Four out of five of these distressingly afflicted victims can be given decided relief by means of a standardized series of injections.

Such a series of injections is available when POLLEN ANTIGEN *Lederle* is employed.

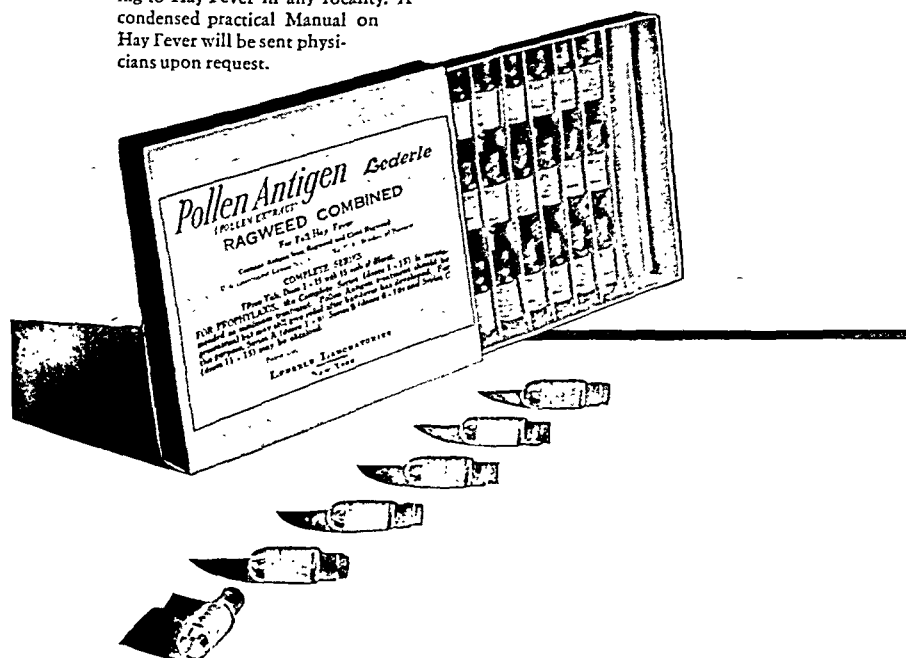
Treatment sets comprise fifteen graduated doses which simplify the administration of appropriate amounts of the specific POLLEN ANTIGEN.

LEDERLE LABORATORIES, INC.

1396 St. Catherine St., West
Montreal, Quebec.

Fisher & Burpe
219 Kennedy Street
Winnipeg, Manitoba, Canada.

LEDERLE LABORATORIES maintain a Department of Allergy supervised by experts who welcome correspondence from physicians on all questions pertaining to Hay Fever in any locality. A condensed practical Manual on Hay Fever will be sent physicians upon request.





AGAROL

PHYSIOLOGIC RHYTHMICITY

Agarol creates no intestinal hurricane, it acts in harmony with the gentleness and rhythmicity of normal peristalsis. The intestinal contents are softened with unabsorbable mineral oil, the fecal mass is kept pliable and passes out with ease through the lubricated channel. There is no excess of mineral oil to form lakes and cause leakage. There is no "peristaltic rush" with Agarol, but its phenolphthalein content affords adequate stimulation of the intestinal musculature to assure thorough, painless and *timed* evacuation... Pleasant taste adds to the desirability of Agarol as a therapeutic measure in acute and habitual constipation. Write for a trial supply on your letterhead.



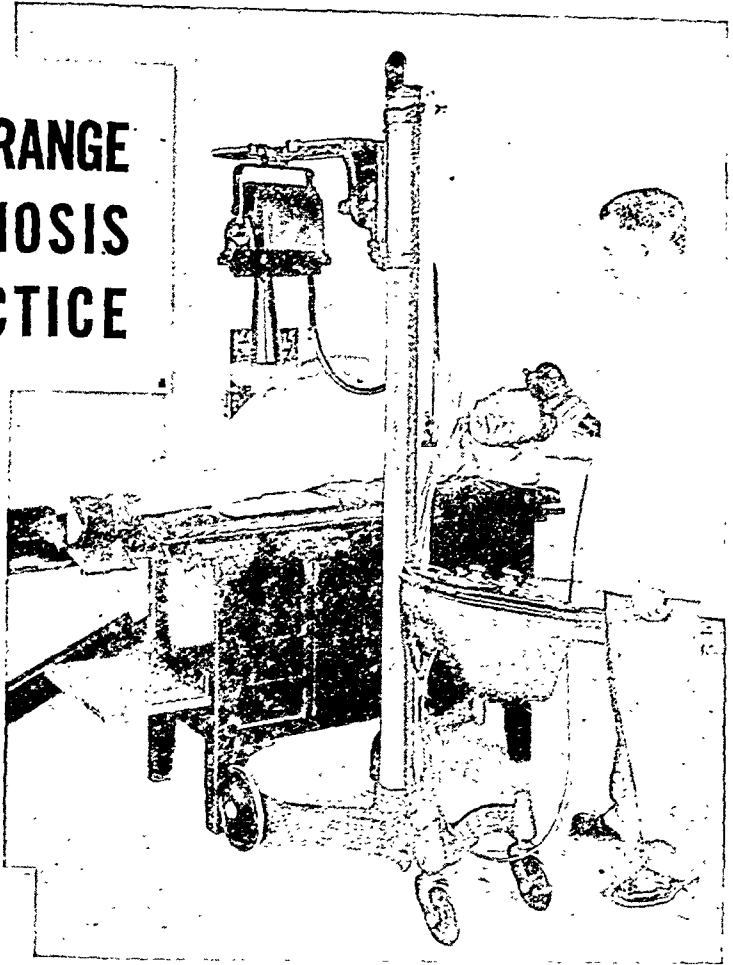
AGAROL

Bottles of 6, 10 and 16 ounces. Average dose is one tablespoonful.

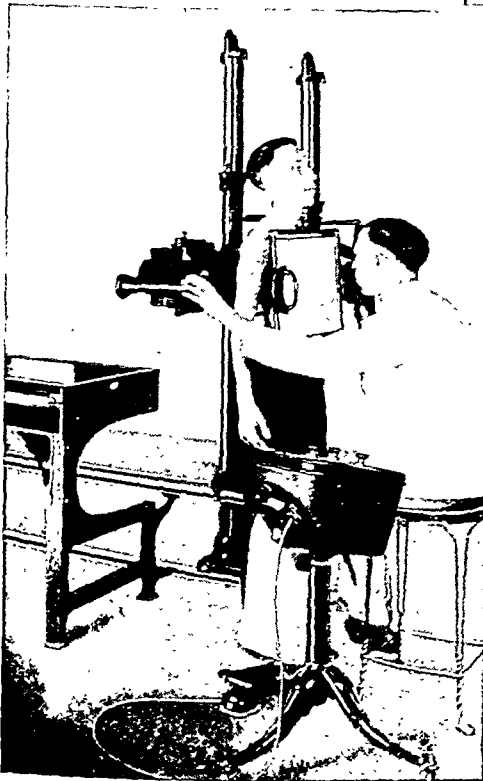
WILLIAM R. WARNER & CO., LTD.
727 King Street, West, Toronto, Ontario

FOR A PRACTICAL RANGE OF X-RAY DIAGNOSIS IN OFFICE PRACTICE

Physicians Acclaim Quality of Work Produced with G-E Model "D" Oil-Immersed Shock Proof X-Ray Unit



The Model "D" Unit, mobile type, can be used in any part of the office or building. This view shows how the office examination couch may be utilized for radiography with the unit.



This is the "DRF" Unit, a combination of the Model "D" with an x-ray table for radiographic and fluoroscopic diagnosis. Here the tube head has been shifted along the floor rails to the foot of the table, for vertical fluoroscopy.

● In the final analysis, an x-ray unit must be judged by the quality of results obtained, for the simple reason that diagnosis is based on what it enables you to visualize in the radiograph or the fluoroscopic screen.

The Model "D" Unit has become widely popular in office practice because it offers a practical range of diagnostic service, in the most compact form, with the utmost flexibility of application, simplicity of operation, and consistent performance. All this in addition to complete safety against high voltage shock, and a resulting quality of work in which hundreds of Model "D" users take justifiable pride.

Not until you have thoroughly investigated the possibilities of this apparatus can you really appreciate its value in routine office practice. Address Dept. A64, for full details, including the nominal price and convenient terms of payment which place it within your means.

**GENERAL  ELECTRIC
X-RAY CORPORATION**

2012 JACKSON BLVD.

CHICAGO, ILLINOIS

Distributors: VICTOR X-RAY CORPORATION OF CANADA, LTD., Montreal, Toronto, Winnipeg, Vancouver

Dial "Ciba"

(Diallylmalonylurea.)

Dial calms excited, irritated nerves, and for such occasions as nervous insomnia, mental and traumatic agitation, pre-operative restlessness, etc., it will fulfil all the requirements of *a good hypnotic*

AMPOULES - TABLETS - ELIXIR

CibalGINE "Ciba"

(A combination of dimethylamino-phenyl-dimethyl-pyrazolone and Dial.)

CibalGINE is indicated in the treatment of pain of every description, febrile manifestations, nervous excitement, insomnia due to pain, dysmenorrhœa, etc. CibalGINE represents a non-narcotic analgesic and antipyretic *worthy of the physician's confidence*

AMPOULES - TABLETS - ELIXIR

CIBA
COMPANY
Limited
MONTREAL

*Sole Representatives
for
Androstine "CIBA"*

To enable your
patients to obtain
LACTOGEN
at a *lower*
price



the
price of
the 1-lb. size
can of **LACTOGEN**
has been reduced
to our wholesale
trade by
16 $\frac{2}{3}$ %

NESTLÉ'S MILK PRODUCTS
(CANADA) LTD.
Metropolitan Building
TORONTO - CANADA

You can Recommend Them with Confidence

Carbohydrates in their most easily digested form—"Crown Brand" and "Lily White" Corn Syrups used in conjunction with cow's milk provide the most efficient and economical bottle feed for infants. Their low cost with equal quality in comparison with the more expensive prepared carbohydrates make them by far the most economical infant food you can use or recommend.

Many leading physicians have for years specified these two famous brands with confidence and knowledge of the hygienic conditions under which they are manufactured.



EDWARDSBURG
CROWN BRAND CORN SYRUP
and **LILY WHITE CORN SYRUP**

Manufactured by THE CANADA STARCH COMPANY Limited

FOR THE MEDICAL PROFESSION

A convenient pocket calculator, with varied infant feeding formulae employing these two famous corn syrups, and a scientific treatise in book form for infant feeding, also prescription pads, are available on request. Kindly clip the coupon below and this useful material will be mailed to you immediately.

THE CANADA STARCH CO., Limited
Montreal

Please send me

- ☐ FEEDING CALCULATOR.
☐ Book "CORN SYRUPS FOR INFANT FEEDING".
☐ PRESCRIPTION PADS.

Name

Address

.....

.....

RADIOSTOLEUM

A VALUABLE PROPHYLACTIC IN SEASONAL EPIDEMICS

Radiostoleum, by reason of its standardized content of Vitamin A, provides a valuable safeguard against attacks of invading organisms in epidemics of coughs, colds, influenza, tonsillitis and, indeed, in any infection which has as a contributory root-cause a break-down in the integrity of the epithelial linings throughout the body. Its Vitamin D content ensures correct calcium and phosphorus metabolism with consequent normal skeletal development.

IN
LIQUID
AND IN
CAPSULES

Stocks are held by leading druggists throughout the Dominion, and full particulars are available from

THE BRITISH DRUG HOUSES (CANADA) LTD.
Terminal Warehouse
Toronto 2, Ont.



Rstm/Can/364

What should be prescribed in CHRONIC RHEUMATISM?



Lysidin bitartrate, to promote elimination of protein disintegration products.

Iodo-propanol-sodium sulphonate, to supply indicated iodine and sulphur.

Calcium gluconate, to furnish necessary calcium and prevent its precipitation.

Combined in the form of

LYXANTHINE ASTIER

these agents bring about the rapid disappearance of peri-articular infiltration, subsidence of swelling, stiffness and numbness, pain relief, increased articular motility.

Non irritant, well tolerated, cholagogue, and, in larger dosage, laxative.

LYXANTHINE ASTIER makes it possible gradually to discard the use of salicylates, aspirin or other analgesics.

DOSE: One teaspoonful every 24 hours to be taken in a glass of water, in the morning on an empty stomach, for 20 consecutive days followed by a 10-day rest interval. Two teaspoonfuls may be given to relieve an acute attack.

Sample and literature on request

Dr. P. ASTIER LABORATORIES

36 - 48 Caledonia Road, Toronto

350 LeMoyne Street, Montreal

ick Room

You will find many uses for Lavis about the sick room. Here, indeed, occasions arise at every hand when its free use will largely contribute to the patient's comfort and well-being.

During illness, as in febrile conditions when breath is foul, tongue dry and mouth generally unsanitary, Lavis cleanses, deodorizes and lessens dangers from absorption, ingestion and aspiration of toxic material.

Spraying Lavis about the room freshens the air. Applying Lavis to irritated skin soothes and toughens tender surfaces.



LAVIS

MADE
IN
CANADA

Lavis Chemical Company Limited, 92 Jarvis Street, Toronto, Canada

precise **ACCURACY**
with **PORTABILITY**
and these **FEATURES**

- Calibration 250 or 300 mm.
- Weight 30 ounces.
- Inflation system self-contained.
- Cast Duralumin Case.
- Manometer of stainless steel.
- Nameplate cast in cover.
- Individually calibrated Pyrex glass tubes.
- Stated reservoir.
- Unobstructed legible scale.
- Lifetime guarantee against glass breakage.
- Perpetual guarantee for accuracy.
- Price \$29.50.

KOMPAK MODEL
SMALLEST
LIGHTEST
HANDIEST

Lifetime
Baumanometer
STANDARD FOR BLOODPRESSURE

W. A. BAUM CO. Inc. NEW YORK
SINCE 1916 ORIGINATORS AND MAKERS OF
BLOODPRESSURE APPARATUS EXCLUSIVELY

A TRUE MERCURY GRAVITY INSTRUMENT

DR COLLECTEM

THE BEST KNOWN CHEQUE IN CANADA

—among doctors— is drawn Each Tuesday on The Imperial Bank of Canada, Adelaide and Victoria Sts., Toronto. Here's the signature—

The Medical Audit Association (TRUST ACCOUNT)

PER

If you're not already getting one of these weekly cheques, Doctor, just run through your ledger, jot down the bare details of your past-due accounts on your own letterhead, and

Mail us your list To-Day!

THE MEDICAL AUDIT ASSOCIATION

44 VICTORIA STREET, TORONTO

VI-TONE

The Delicious Nourishing Food
Beverage—

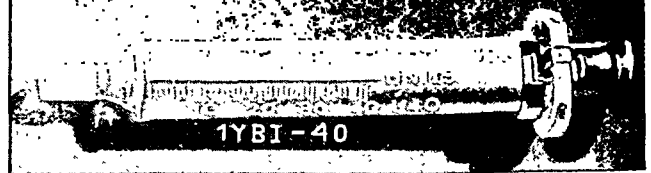
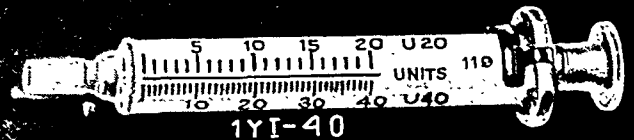
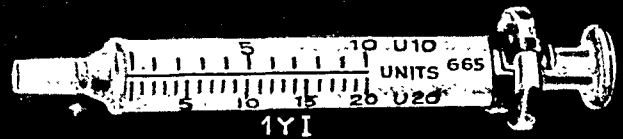
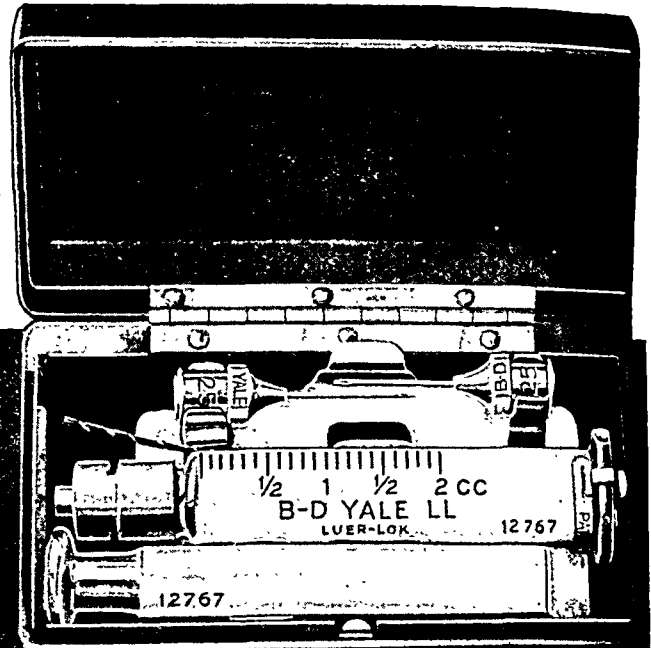
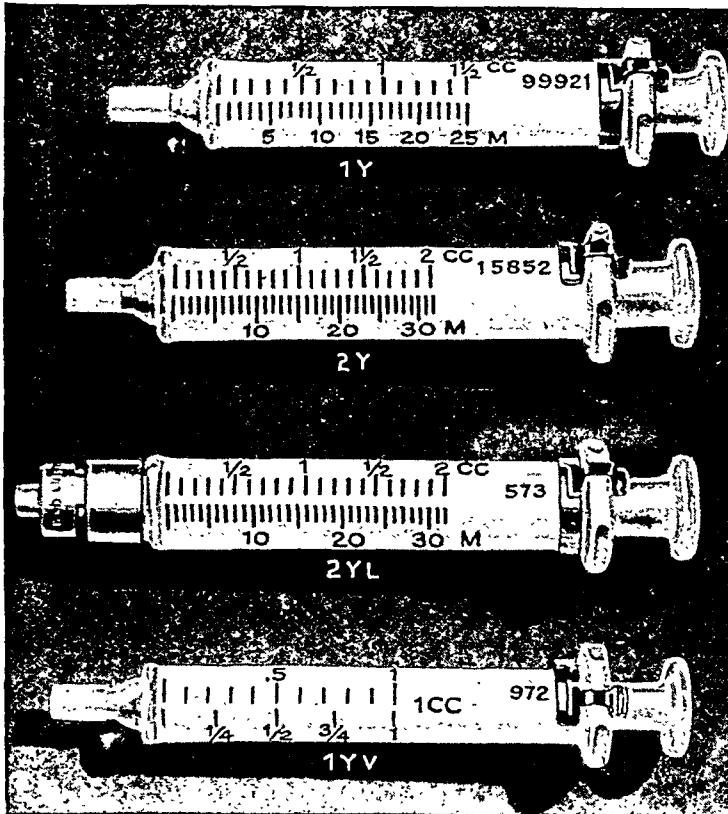


Is recommended as a liquid food to be taken between meals where frequent easily digested and well-balanced nourishment is required or hot before retiring.

VI-TONE COMPANY

HAMILTON - - CANADA

NO EXTRA COST for this Bakelite Case



WHEN PURCHASING A B-D SYRINGE AND TWO B-D NEEDLES

B-D PRODUCTS

Made for the Profession

THE Bakelite case has a removable metal tray with spring clips which hold plunger, barrel and needles separately. It is made of strong black Bakelite with metal hinges. Any one of the syringes illustrated and two B-D needles may be obtained in this convenient Bakelite case by prefixing "O" to the syringe number shown, when ordering.

No. 1Y. Capacity $1\frac{1}{2}$ c.c. Graduated in $\frac{1}{10}$ c.c. and minims.

No. 2Y. Capacity 2 c.c. Graduated in $\frac{1}{10}$ c.c. and minims.

No. 2YL. Capacity 2 c.c. Graduated in $\frac{1}{10}$ c.c. and minims. A half-turn locks any B-D needle securely on the strong Luer-Lok metal tip. Needle will not loosen or leak.

No. 1YV. Capacity 1 c.c. Graduated in $\frac{1}{10}$ and $\frac{1}{4}$ c.c. For use with vaccines and medications where exact small dosage is essential.

No. 1YI. Capacity 1 c.c. Scales graduated for use with 10 or 20 units insulin.

No. 1YI/40. Capacity 1 c.c. Scales graduated for use with 20 or 40 units insulin.

No. 1YBI. Capacity 1 c.c. Scales graduated for use with 10 or 20 units insulin. Special blue glass plunger facilitates accurate dosage.

No. 1YBI/40. Capacity 1 c.c. Scales graduated for use with 20 or 40 units insulin. Special blue glass plunger facilitates accurate dosage.

Syringes Nos. 1YV, 1YI, 1YI/40, 1YBI and 1YBI/40 fit the B-D Busher Automatic Injector.

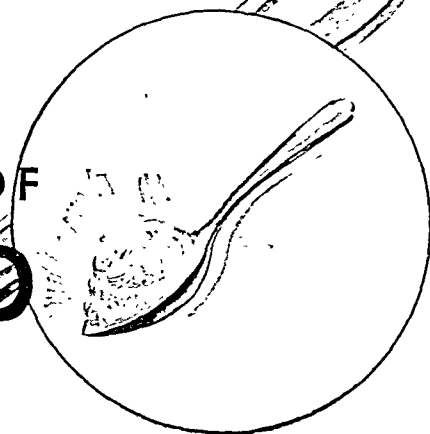
BECTON, DICKINSON & CO., RUTHERFORD, N. J.

NO. 27 of a Series of Advertisements prepared in the Interest of Acetanilid B.P. by BROMO-SELTZER LTD.

Now Recorded for the First Time

64:1...

A THERAPEUTIC RATIO OF
ACETANILID



the minimal therapeutic dose a 'therapeutic ratio' for rats of 64:1 is obtained."

This large ratio is further proof of what has previously been pointed out by other authorities, namely, the safety of acetanilid in therapeutic doses.

"STUDIES of the antipyretic activity and toxicity of acetanilid in the same species of animal have not heretofore been recorded," say Smith and Hambourger*. These investigators gave acetanilid to rats made febrile by subcutaneous injections of yeast, and observed that the average minimum dose producing fall in temperature was 12.5 mg. per kilogram. Fatal doses averaged 800 mg. per kilogram.

They conclude:—"By dividing the 'fatal dose' of acetanilid by

Acetanilid and Acetphenetidin, known even more widely for their pain-relieving properties than their antipyretic action, are available in a scientifically prepared pharmaceutical. Caffeine and bromide have been added, and the combination has been made into a palatable effervescent drink by the inclusion of citrates. A request will bring you promptly sample and literature.

*P. K. Smith & W. E. Hambourger, J. Pharm. Exp. Ther., July, 1935, p. 346.

BROMO-SELTZER LIMITED
TORONTO - - CANADA

HOMÖGENIZED FOODS— *Protect Infants in the critical months*

A comparison of the digestibility of home-strained, commercially-strained and Homogenized vegetables.
(Photomicrographs taken through microscope at 100 times magnification)



Home-strained vegetables after 2 hours' exposure to human duodenal juice. Dark areas show undigested nutriment after 2 hours. When these undigested food cells pass into the lower intestine, there is probability of fermentation.



Commercial-strained vegetables after 2 hours' in-vitro digestion. Here, also, dark areas show undigested nutriment. Needed nourishment is lost to the infant. And intestinal upsets may be caused by half-digested food fermenting in the lower intestine.



Libby's Homogenized vegetables after only 30 minutes' digestion. Notice absence of dark areas. No undigested nutriment. All nutriment has been assimilated. Homogenized foods digest quickly and completely. No half-digested food passes into lower intestine to ferment and cause irritation.

Libby's Homogenized Foods—Included in Regular Dionne Quintuplets' Diet.



Photograph Copyright, Star Newspaper Service

DURING the critical months when the infant is changing from liquid to solid foods, the diet may be managed with a minimum of danger or upsets in digestion. This advance in infant feeding has been brought about by Libby's special process of homogenizing solid foods.

This special homogenization makes babies' foods far smoother and finer than the most carefully prepared strained foods, and the foods digest far faster, and easier. Scientific tests indicate that the infant gets more nourishment. Babies fed homogenized vegetables, fruits, soup and cereal every day show better weight gains and develop firmer muscles.

Homogenized Foods may be tolerated successfully as early as three months.

Libby's Homogenized Foods are available in a complete solid food diet in only six tins. They comprise three vegetable combinations, a cereal combination, a fruit combination and a soup, providing a balanced blend of food essentials in the diet.

Pediatricians and physicians are invited to write Libby, McNeill & Libby Laboratories, Chatham, Ontario, for a series of bulletins which summarize the research on infant feeding that Libby has conducted. Also for samples of Libby's complete line of Homogenized Foods.

LIBBY, McNEILL & LIBBY OF CANADA LIMITED
CHATHAM . . . ONTARIO

Libby's Baby Foods in 6 balanced combinations:

- 1 Peas, beets, asparagus tips
- 2 String beans, pumpkin, tomatoes
- 3 Carrots, spinach, peas
- 4 Cereal Combination . . . whole milk, whole wheat, soy bean flour
- 5 Prunes, pineapple juice, lemon juice
- 6 Soup—vegetables, chicken livers, barley



Libby's
Made in Canada

**Homögenized
FOODS FOR BABIES**

UNSEASONED EXCEPT FOR SALT • PACKED IN ENAMEL-LINED TINS

COLDS

Accompanied by fever....

When the patient has fever, it is generally agreed that he needs to be kept in bed. To diminish febrile acidosis—use BiSoDol.

BiSoDol—the balanced antacid—enables you to give massive doses at frequent intervals with less danger of alkali-imbalance.

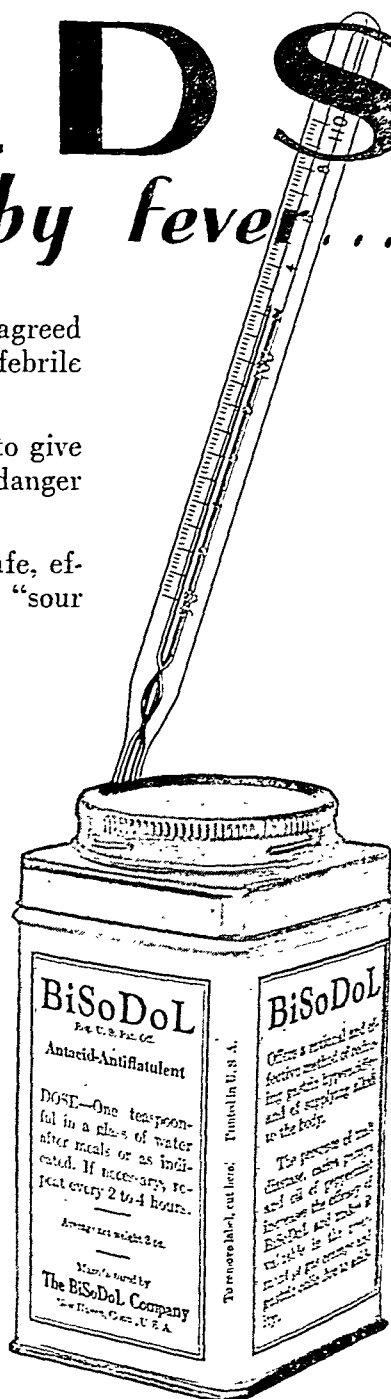
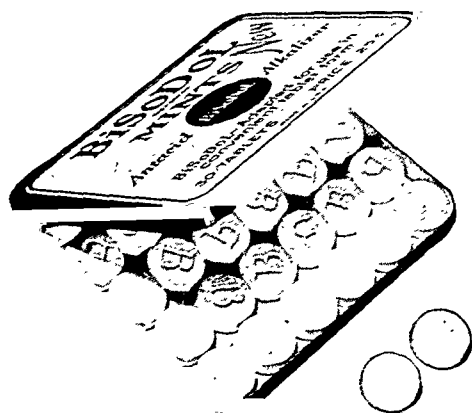
BiSoDol has been used for many years as a safe, effective first-aid in relieving acid indigestion, "sour stomach."

NOW—For Convenience IN TWO FORMS

BiSoDol is also available in the convenient form of BiSoDol Mints—quick-acting, pleasantly flavored, easy to carry, available for use at time of discomfort.

Write for samples and literature.

The BiSoDol Company, Walkerville, Ont.



B 2

BiSoDol

Bee venom ointment in the treatment of Rheumatism

The chief advantages of this preparation are as follows:

1. The application of bee venom in the form of an ointment is at least equal in its effect to the older method of injection.
2. Forapin has the advantage that its application is simple and almost painless.
3. It is possible to introduce the large amounts of the venom necessary in chronic cases, without resulting in any considerable pain.
4. The preparation is very inexpensive.

No. 1. (Normal) \$1.65 a tube. No. 2. (strong) \$1.90 a tube.

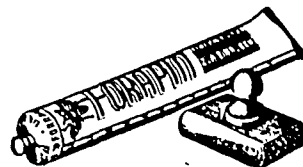


FORAPIN

W. LLOYD WOOD Limited
64-66 Gerrard St. E. Toronto
Canadian Agents



**BEE
VENOM
SALVE**



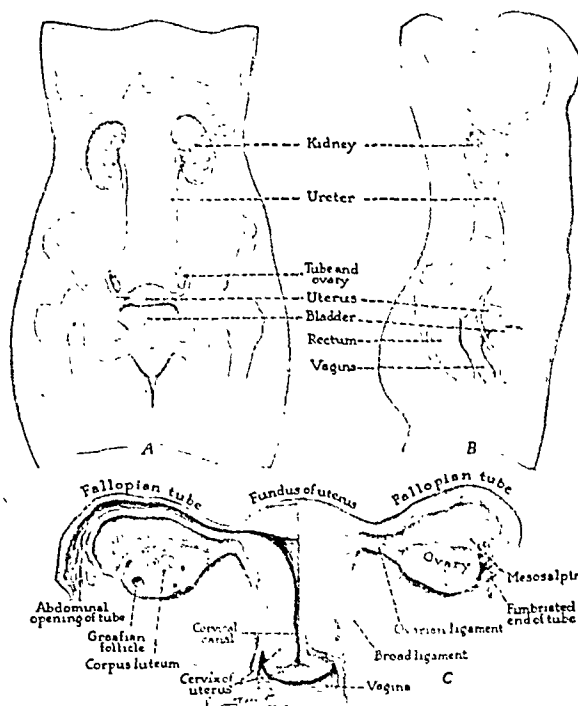
A SET of Anatomical Studies in book form furnished to physicians on request...upon receipt of 20c to cover mailing costs.

CAMP
TRADE MARK

ANATOMICAL
SUPPORTS

ACCEPTED BY
THE COUNCIL ON
PHYSICAL THERAPY
OF THE
AMERICAN MEDICAL
ASSOCIATION

S. H. CAMP & COMPANY
of CANADA, Ltd.,
Manufacturers
Windsor, Ontario, Canada



GENITO-URINARY ORGANS IN THE FEMALE
A—Anteroposterior View; B—Lateral View; C—Uterus and Adnexa (at left with anterior one-half removed)

BAD-NAUHEIM

DEUTSCHLAND (Germany)

*Affections of the Heart and blood
vessels, Rheumatism*

Naturally - warm carbonic-acid
springs with saline contents.

Balneological Institute and
William G. Kerckhoff-Institute, a
combined place of research on af-
fections of the Heart and blood
vessels.

Special terms for physicians and their families

For all particulars apply to

Kurverwaltung Bad - Nauheim



OBEYING ORDERS

... and liking it?

"No caffeine? That's all right with
me, doctor, as long as you give me fine coffee like this!"

And an obstinate patient turns into a good patient,
obeying orders to the tune of *three cups a day!*

Take one good sip of Kaffee-Hag Coffee yourself . . .
and you'll agree, "*This is great coffee.*" Kellogg's new
process takes 97% of the caffeine out . . . but leaves all the
flavor. Rich, mellow, delicious! Blend of finest Brazilian
and Colombian coffees.

And here's a surprise! You can make this new coffee
strong . . . bring out its full, rich flavor . . . and still it
won't turn bitter! Try Kaffee-Hag Coffee in your own home.

**A professional sample will be sent to you
upon request.**



Kellogg's Kaffee-Hag
Coffee is accepted by
the American Medical
Association with the
statement: "Kaffee-
Hag is free from caf-
eine effect, and can
be used where other
coffee has been for-
bidden."



KELLOGG COMPANY OF CANADA, LIMITED
London, Ontario

OVALTINE

TONIC FOOD BEVERAGE

Ovaltine is a pure food concentrate of
high nutritive value. It is used in
leading hospitals and nursing homes the
world over and has the approval of
physicians in 54 different countries.
Conceived originally for delicate patients
and convalescents, Ovaltine's use has
broadened to include nursing mothers
and those suffering from nerv-
ousness, malnutrition and
insomnia.



*Samples for clinical purposes
on request. Simply mail this
coupon.*

A. WANDER LIMITED
Elmwood Park, Peterborough, Ont.

Please send me a clinical sample of Ovaltine. Evidence of pro-
fessional standing is enclosed.

Name

Address

City.....Prov.....

HARVARD MEDICAL SCHOOL COURSES FOR GRADUATES

INTERNAL MEDICINE

DIAGNOSIS AND TREATMENT

at the

MASSACHUSETTS GENERAL HOSPITAL

JUNE 18 - - JULY 30 (6 weeks)

The course provides an up-to-date review of
the diagnosis and treatment of problems most
commonly encountered by medical practi-
tioners and internists. Dr. F. Dennette
Adams, Associate Physician, in charge.

FEE \$200.

ATTENDANCE LIMITED

For more detailed information apply to the
Assistant Dean, Courses for Graduates,
HARVARD MEDICAL SCHOOL, Boston,
Massachusetts.

The Canadian Medical Protective Association

PRESIDENT - JOHN F. ARGUE, M.D.

A mutual medical defence union founded in 1901 at the Winnipeg meeting of the Canadian Medical Association, incorporated by act of Dominion Parliament February 1913, and affiliated with the Canadian Medical Association 1924.

OBJECTS: To assist in the defence of its members in cases of alleged malpractice, and to encourage honourable practice in the daily work of the medical profession. The annual fee is five dollars per calendar year, half-rates after July first.

Subject to our by-laws, assistance is given by the payment of the taxable costs of actions together with reasonable counsel and witness fees in cases undertaken by our Association, as well as damages if awarded. All members in good standing of the Canadian and various Provincial Medical Associations may be enrolled upon signing the application form and paying the annual fee. All other regularly qualified practitioners must have their application countersigned by two members of our Association. Blank application forms and other literature upon request.

ADDRESS ALL CORRESPONDENCE TO THE SECRETARY-TREASURER

SUITE 401 - 180 METCALFE STREET, OTTAWA, CANADA

CHARLES B. TOWNS HOSPITAL

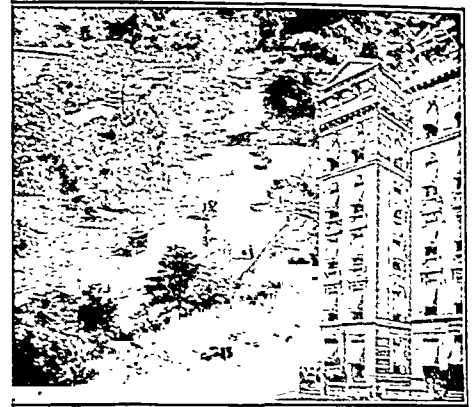
293 Central Park West

New York, New York

For ALCOHOLISM and DRUG ADDICTION

ANY
PHYSICIAN
having an
addict prob-
lem is invited
to write for
Hospital lit-
erature.

This institution has specialized in addictions for over 30 years. Its method of treatment has been fully described in THE JOURNAL A. M. A.; in The Handbook of Therapy, from the A. M. A. Press; and in other scientific literature. The treatment is a regular hospital procedure, and provides a definite means for eliminating the toxic products of alcohol and drugs from the tissues. A complete Department of Physical Therapy, with gymnasium and other facilities for physical rebuilding, is maintained. Operated as an "open" institution. Physicians are not only invited but urged to accompany and stay with their patients.



Located Directly
Across from Central Park

When Visiting London



buyers should make a point of calling at British Industries House, where all the most modern British medical equipment may be examined in comfort under one roof. Whether it is Hospital, Medical, Pharmaceutical or Ophthalmic apparatus that is required, it will be possible to get estimates and tenders at competitive prices, in the minimum time and without unnecessary travelling expense. Visits should be made and enquiries sent to

BRITISH INDUSTRIES HOUSE

MARBLE ARCH . . LONDON . . ENGLAND

TRUSSES

The Spot-Pad, Non-Skid truss has been developed during 42 years of manufacturing. It is the result of a conscientious attempt to furnish an entirely practical, safe, comfortable and sanitary appliance of the highest quality.

Also Makers Of

Airway Surgical Supports Umbilical Trusses
Maternity Supporters
Non-Skid Arch Supporters Crutches

Professional Discount

OTTAWA TRUSS CO. of Canada Limited
304 Wellington Street - Ottawa



For The "CURE"
**White Sulphur
Springs** west virginia

European Baths ~ American Facilities

The Greenbrier and Cottages
open all year round

DR. GUY HINSDALE, Director
Medical and Bath Department

L. R. JOHNSTON
General Manager

Columbia University New York Post-Graduate Medical School

Intensive One Week Course in
TRAUMATIC SURGERY INCLUDING FRACTURES
for Industrial and General Surgeons

Under the direction of Dr. John J. Moorhead

May 18-23, 1936

Fee \$35

THIS intensive course is intended to review quickly yet thoroughly the modern methods of diagnosis and treatment of fractures. The care of damaged soft structures including visceral trauma is discussed in detail. Fractures are followed throughout the stages of repair and end-results are computed.

The course also includes surgical anatomy and operative procedures, radiology, physical therapy, medico-legal and compensation aspects with regard to trauma, records and follow-ups, intravenous therapy in trauma, pre-operative, operative and post-operative clinics, staff rounds and conferences, localization of cranial lesions, medical complications of trauma, antiseptics, splints and apparatus. The conditions that will be stressed in a series of lectures and demonstrations are all varieties of fractures, low-back pain, the surgical knee, traumatic shoulder, head injuries, hand infections, joint injuries, osteomyelitis, wounds and burns, tendon and nerve injuries.

For further information, address

The Director

311 East 20th Street, New York City

Cook County Graduate School of Medicine

(IN AFFILIATION WITH COOK COUNTY HOSPITAL)

Announces Continuous Courses

MEDICINE—Informal Course; Personal Courses; Intensive Course Two weeks starting April 13th.

SURGERY—General Course One, Two, Three and Six Months; Intensive Course Surgical Technique every two weeks; Special Courses.

GYNECOLOGY—Three Months Course; Intensive Course Two Weeks; Combined Course Four Weeks Gyn. & Obst. starting May 4th.

OBSTETRICS—Informal Course; Intensive Course Two Weeks; Combined Course Four Weeks Gyn. & Obst. starting May 4th.

FRACTURES AND TRAUMATIC SURGERY—Informal Practical Course; Intensive Course Ten Days starting April 13th.

PEDIATRICS—Informal Course; Two Weeks Course starting May 4th.

EAR, NOSE AND THROAT—Informal Course; Intensive Course Two Weeks; Special Courses.

UROLOGY—General Course Two Months; Intensive Course Two Weeks; Special Courses.

CYSTOSCOPY—Intensive Course every two weeks (Attendance limited).

General, Intensive and Special Courses in Tuberculosis, Ophthalmology, Roentgenology, Dermatology and Syphilology, Pathology, Neurology, Electrocardiography, Topographical and Surgical Anatomy, Physical Therapy, Gastro Enterology, Allergy, Hemorrhoids and Varicose Veins.

Teaching Faculty—Attending Staff of Cook County Hospital

Address: Registrar

427 South Honore Street, Chicago, Illinois

WOOD SANATORIUM

FOR THE TREATMENT
OF ADDICTION TO ALCOHOL

The treatment administered by Wood Sanatorium, opened 1931, establishes systemic incompatibility with alcohol, builds up and regulates organic functions and renders patients free from all desire for alcoholic stimulant.

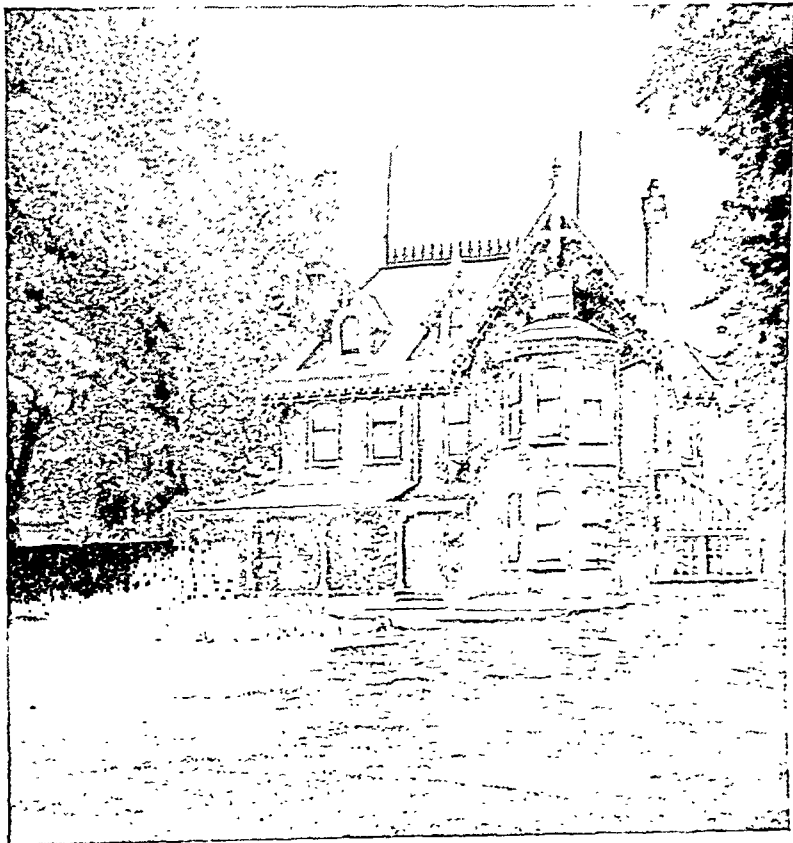
Wood Sanatorium is regularly registered and inspected by Departments of Health. All treatment under strict medical supervision, and nursing attendance. Complete facilities and commodious accommodations.

Medical practitioners are requested to make personal investigation and enquiry. Complete information freely given.

GEO. R. WOOD, Phm.C.
Superintendent

THE CLAREMONT
121 Emerald Street South
Hamilton, Ont.
and

J. T. WOOD, Phm.C.
Superintendent
47 Cornish Avenue
Winnipeg, Man.

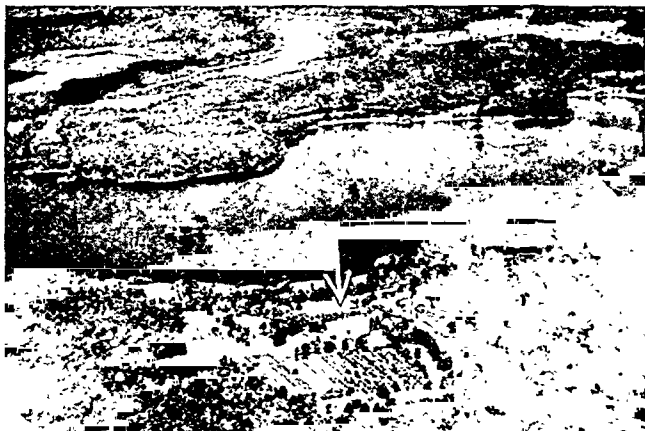


NEW ENGLAND SANITARIUM

(MELROSE P.O.) STONEHAM, MASS.

Ideal location on the shores of large lake, eight miles from Boston, in midst of 4,500 acre State Park. Overnight from nearly all points in Eastern Canada. Reasonable rates.

One hundred forty Pleasant, Home-like Rooms. Six resident Physicians, Seventy Trained Nurses. Experienced Dietitians and Technicians.



Aerial View—Arrow denotes buildings and 40 acres of spacious grounds



Main entrance

Scientific Equipment for Hydrotherapy, Electrotherapy and X-Ray, Occupational Therapy, Gymnasium, Golf, Solarium. Full health examinations and careful diagnosis. No Mental, Tubercular or Contagious diseases received. Physicians are invited to visit the institution. Ethical co-operation. Member American Hospital Association.

For booklet C and detailed information address:
W. A. RUBLE, M.D., L.R.C.P., L.R.C.S. (Edin.)
Medical Director

THE BURGESS PAVILION VERDUN PROTESTANT HOSPITAL

Verdun, Montreal, Que.

A private sanitarium for the treatment of diseases of the nervous system. Selected cases of alcoholism and drug addiction are also received. Amid quiet country surroundings with spacious grounds it is only fifteen minutes from the centre of Montreal. Modern in construction with hydrotherapeutic and electrotherapeutic equipment.



*For information as to rates, etc.
address:*

Dr. C. A. Porteous
P. O. Box 4019, Montreal, Que.

LOVAT HALL LANCASTER, ONTARIO

A private Sanitarium devoted to the treatment of convalescents, people run down in health and nervous, alcoholic and drug cases and mental patients of milder type.

Two houses comfortably and artistically furnished.

Patients classified according to nature of ailment.

The estate comprises 48 acres of lawns, woods and gardens.

LARGE SOLARIUM OVERLOOKING
LAKE ST. FRANCIS.
NO INSTITUTIONAL ATMOSPHERE.

Golf, Tennis, Badminton, Occupation.
Hydrotherapy, Electrotherapy,
Psychotherapy.

A. G. MORPHY, B.A., M.D.
Medical Director

THE FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION

No. 1, Wimpole Street, London, W. 1.

with which is associated some 50 General and Special Hospitals in London, is prepared to offer the following facilities to qualified practitioners:

- I General Courses are arranged covering all branches of Medicine and Surgery. These Courses occupy the student for several hours every day and last for two weeks.
- II Rota of teachers, giving personal tuition at hospital clinics, is arranged and full details are available on application.
- III Special Courses are arranged at the Special Hospitals associated with the Fellowship, and permit of intensive study in one specialty for a period ranging from 1 week to one month.

Provisional Courses in 1936.

Heart and Lungs (Week-end Course)	Apr. 18 & Apr. 19.—Victoria Park Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
Proctology	April 20 to April 25.—St. Mark's Hospital. All day. Fee £3. 3s. 0d.
Psychological Medicine	April 27 to May 30.—Maudsley Hospital. Afternoons. Fee £5. 5s. 0d.
Medicine, Surgery and Gynaecology	April 27 to May 9.—Royal Waterloo Hospital. All day. Fee £3. 3s. 0d.
M.R.C.P. (Chest)	June 15 to July 11.—Brompton Hospital. Two afternoons weekly. 5 to 6.30 p.m. Fee £3. 13s. 6d. (Limited to 6 per class).
Fevers (Week-end Course)	June 20 & June 21.—Park Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d. (Limited to 20).
Surgery (Week-end Course)	June 27 & June 28.—Prince of Wales's General Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
Children's Diseases (Week-end Course)	July 4 & July 5.—Princess Elizabeth of York Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
Proctology	July 6 to July 11.—St. Mark's Hospital. All day. Fee £3. 3s. 0d.
Heart and Lungs (Week-end Course)	July 11 & July 12.—Victoria Park Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
Dermatology	July 13 to July 25.—Hospital for Diseases of the Skin, Blackfriars. Afternoons. Fee £1. 1s. 0d.
Urology	July 13 to Aug. 1.—All Saints Hospital. Afternoons and evenings. Fee £2. 12s. 6d.
<i>August 3rd, BANK HOLIDAY.</i>	
Infants' Diseases	Aug. 31 to Sept. 12.—Infants' Hospital. Afternoons. Fee £3. 3s. 0d.
M.R.C.P. (Evening Course)	Sept. 8 to Sept. 24.—National Temperance Hospital. Tues. and Thurs. evenings at 8.0 p.m. Clinical and Pathological. Fee £6. 6s. 0d. (Maximum of 24).
M.R.C.P. (Chest)	Sept. 14 to Oct. 10.—Brompton Hospital. Two days weekly. 5 to 6.30 p.m. Fee £3. 13s. 6d. (Limited to 6 per class).
Surgery (Week-end Course)	Sept. 19 and Sept. 20.—Miller General Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
*M.R.C.P. (Chest and Heart) (Evening Course)	Sept. 21 to Oct. 9.—Royal Chest Hospital. Mons., Weds. and Fris. 8 to 10 p.m. Fee £4. 14s. 6d. (Non-members £5. 15s. 6d.)
Chest Diseases	Sept. 21 to Sept. 26.—Brompton Hospital. All day. Fee £3. 3s. 0d.
Ophthalmology (Week-end Course)	Sept. 26 and Sept. 27.—Royal Westminster Ophthalmic Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
Proctology	Sept. 28 to Oct. 3.—Gordon Hospital. All day. Fee £2. 2s. 0d.

* Open to non-members.

Copies of all Special Course syllabuses and of the General Course Program may be obtained on application. The Hospitals reserve the right to make any alterations necessary in dates and fees. Post-graduates are advised, therefore, to make early enquiry. Other courses are arranged from time to time, in addition to the above list.

Courses are open only to Members of the Fellowship of Medicine; the annual subscription (from the month of joining) is £1. 1s. 0d., which includes the subscription to the *Monthly Post-Graduate Medical Journal*. Overseas subscription, to the Journal only, is 12/- per annum, post free. Every effort is made to assist Members to obtain the post-graduate work they require.

H. U. MORLOCK, M.C., M.D., M.R.C.P.,

DAVID LEVI, M.S.

Honorary Secretaries

HOMWOOD SANITARIUM

GUELPH, ONTARIO



HOMWOOD is a private hospital for nervous, mental and habit cases; specially equipped to provide all forms of treatment, such as:—Occupational Therapy, Electrotherapy, Hydrotherapy, Massage and games, (tennis, bowling, croquet, bridge, billiards, etc.)
30 ACRES of natural park, lawns and flower gardens.

Write or telephone for booklet and rates.

ADDRESS: DR. HARVEY CLARE, Medical Superintendent, Guelph, Ontario
PHONE GUELPH 53

McGill University

MONTREAL

FACULTY OF MEDICINE

C. F. Martin, B.A., M.D., C.M., LL.D., Dean

Beginning with the Session 1936-37 the course of study leading to the degree of M.D., C.M., will comprise *four* academic years of nine months each. Following this, the graduate will be required to spend one year as an interne in an approved hospital or a year of further study in the Faculty of Medicine of McGill University, or in another medical school approved by it, before he can obtain a certificate of eligibility for licensure.

Opportunities for graduate study are offered in the basic medical sciences and in the clinical fields and courses leading to the M.Sc. and Ph.D. degrees are given under the direction of the Faculty of Graduate Studies and Research.

A practical course leading to the Diploma of Public Health is open to medical graduates and Public Health Officers.

Full particulars of entrance requirements, fees, curriculum, etc. are given in the Annual Announcement which may be obtained on application to

PROF. J. C. SIMPSON

Secretary of the Faculty of Medicine

THE NEW YORK POLYCLINIC MEDICAL SCHOOL AND HOSPITAL

(ORGANIZED 1881)

(The Pioneer Post-Graduate Medical Institution in America.)

TRAUMATIC SURGERY

including

General Surgery, Orthopedic Surgery, Physical Therapy, Anatomical Review and Operative Surgery on the Cadaver.

PATHOLOGY and BACTERIOLOGY

POST-GRADUATE INSTRUCTION

comprising

MEDICINE, SURGERY and ALLIED SPECIALTIES

PHYSICAL THERAPY

Lectures and demonstrations in electrotherapy, electro-diagnosis and minor electrosurgery; light therapy; hydro and thermo-therapy, including fever therapy; massage and therapeutic exercise. Active clinical work in treatment of medical and surgical conditions.

FOR INFORMATION ADDRESS

MEDICAL EXECUTIVE OFFICER, 345 West 50th St., New York City



Hollywood Sanitarium

New Westminster, British Columbia

For the treatment of Nervous, Alcoholic, Toxic, Neurologic and Psychopathic cases exclusively.

Reference: B.C. Medical Association

Write for prospectus and rates to the
Medical Superintendent.

WHY NOT GET THE F.R.C.S.?

Canadian and American Surgeons should send Coupon below
for our valuable publication

"How to Pass the F.R.C.S."

Principal Contents.

The F.R.C.S. England, Primary and Final.
The F.R.C.S. Edinburgh, Ireland.
Diploma in Ophthalmology.
Diploma in Laryngology, Otology, etc.
Other Higher Surgical Qualifications.

The primary F.R.C.S. England examinations can now be taken in Canada. Examinations are held annually in October.

You can prepare for any of these qualifications by taking our intensive postal courses of instruction at home and come to England when ready for the examination.
The F.R.C.S. of England or Edinburgh is within the reach of every Canadian or American Surgeon.
Let us help you to get it.

THE SECRETARY MEDICAL CORRESPONDENCE COLLEGE

19 Welbeck Street,
London, W.1, England

Sir,—Please send me your booklet
"How to Pass the F.R.C.S.," also
"Guide to Medical Examinations"
by return.

Name

Address

C.M.A.

A BRIEF REVIEW OF THE RESEARCH ON BRAN

WHAT are the scientific facts on bran? To answer this question, the Kellogg Company has aided, for some years, research in leading university laboratories. The results, combined with other independent scientific tests, give you an accurate picture of this product:

Research has established the effectiveness of bran in correcting constipation due to insufficient "bulk." (1)

Other studies indicate that bran is a wholesome food for normal people, and that the laxative effect of bran is not reduced by continued use. (2)

Laboratory measurements (3) have demonstrated that bran is a good source of vitamin B, and (4) that it is rich in available food-iron.

Further tests have demonstrated that, with some individuals, the "bulk" in fruits and vegetables is largely broken down in the alimentary tract. This does not happen with bran. As a result, it is often the more effective source of "bulk." (5)

Kellogg's ALL-BRAN is usually more satisfactory for correcting atonic constipation than the continued use of medicines. A few individuals have diseased or highly sensitive intestines. In these special cases, any form of "bulk" is, of course, contraindicated.

Kellogg's ALL-BRAN may be served as a cereal or made up into muffins, waffles, breads, etc. Sprinkle over soups, salads, or other cereals. ALL-BRAN is much more effective than part-bran products. Eat this delicious cereal regularly for regularity. Sold by all grocers. Made by Kellogg in London, Ontario.

. . .

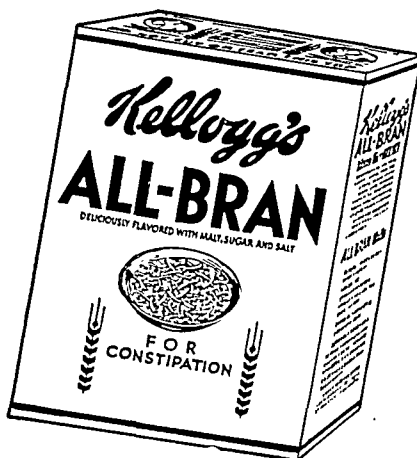
(1) *Laxative Effects of Wheat Bran and "Washed Bran" in Healthy Men*, pages 1866-1875, *J. Am. Med. Assn.*, May 28, 1932.

(2) *The Influence of Bran on the Alimentary Tract*, pages 133-156, *J. Am. Dietetic Assn.*, July, 1932.

(3) *Wheat Bran as a Source of Vitamin B*, pages 368-374, *J. Am. Dietetic Assn.*, March, 1932.

(4) *Factors in Food Influencing Hemoglobin Regeneration*, pages 593-608, *J. Biological Chem.*, June, 1932.

(5) *Further Studies on the Use of Wheat Bran as a Laxative*, pages 795-802, *J. Am. Med. Assn.*, March 18, 1933.



MENINGOCOCCUS ANTITOXIN

DEVELOPED IN THE RESEARCH LABORATORIES OF PARKE, DAVIS & COMPANY

"Meningococcus Antitoxin has reduced by approximately 50 per cent the deaths from meningococcic meningitis at Cook County Hospital."

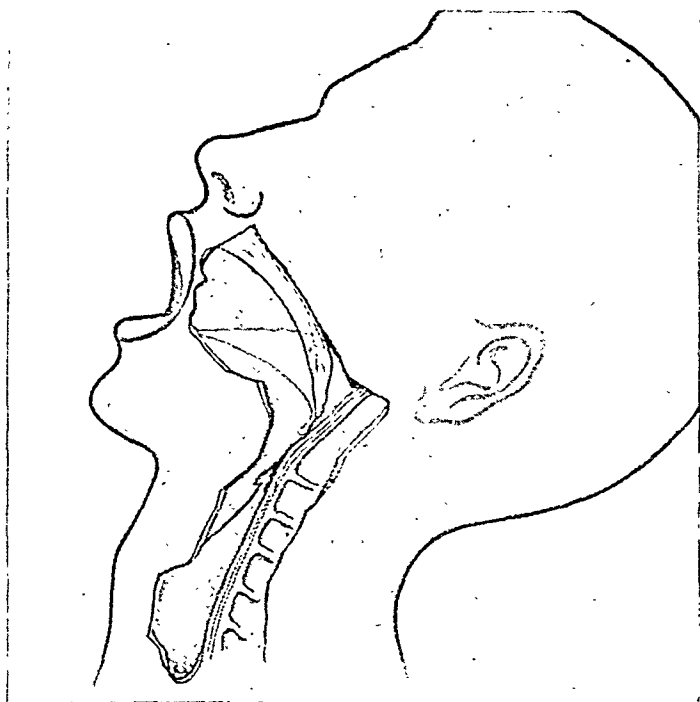
*Journal of the American Medical Association,
Volume 104, page 980, March 23, 1935.*

THE introduction of Meningococcus Antitoxin is a significant contribution to the therapy of contagious diseases. Extensive biological and clinical research has led to the development of this true antitoxin, markedly effective in lowering the mortality in meningococcic meningitis.

Accepted for inclusion in New and Nonofficial Remedies by the Council on Pharmacy and Chemistry of the American Medical Association.

Parke, Davis & Co. - Walkerville, Ont.

Gargling's good as far as it goes (*but it can't go very far*)



● The diagram above shows the approximate effect of gargling an antiseptic solution. Obviously this treatment reaches but a limited area of the throat, since patients are not likely to swallow any great amount of the solution gargled.

Application of medication by atomizer, on the other hand, reaches well into the lower portions of the throat, thus treating areas not reached by gargling.

We shall be glad to send you an interesting pamphlet describing X-Ray tests made to show comparisons between nose and throat treatment by DeVilbiss Atomizer and other methods.

DeVilbiss

The DeVilbiss Mfg. Co., Limited, Windsor, Ontario, headquarters for atomizers and vaporizers for professional and home use

● Palatable... and non-irritating... in the treatment of coughs... grippe... and bronchitis

There is never any reluctance on the part of children or adults in taking Liquid Peptonoids with Creosote. It is palatable, non-irritating and can be retained by the most sensitive stomach. Clinical test will prove the value of this product as a bronchial expectorant and sedative. The coupon will bring samples and literature.

Liquid Peptonoids with Creosote

THE ARLINGTON
CHEMICAL CO.

YONKERS, NEW YORK



W. LLOYD WOOD, LIMITED.
Canadian Agent.

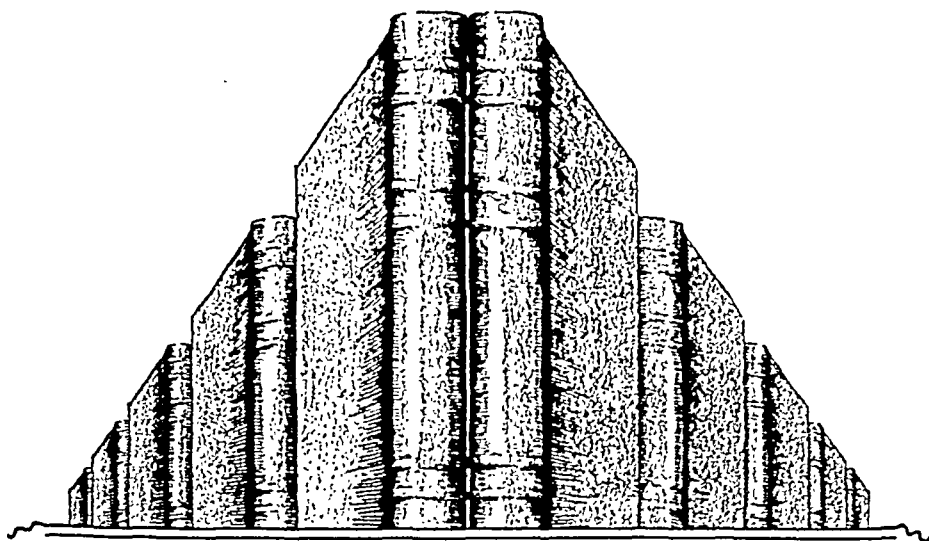
64-66 Gerrard St. E., Toronto C.M.J.-4-36

You may send me at the address below
a sample of Liquid Peptonoids with Creosote.

Dr. _____

Address _____

City _____ Prov. _____



what **AUTHORITIES** *say about*

SALINE APERIENTS

EFFICIENT. Osler cites the saline waters as having a permanently useful effect in correcting digestive conditions. (Osler's Modern Medicine.)

NON-TOXIC. McGuigan says that saline salts are non-toxic. (Text-Book of Pharmacology and Therapeutics.)

SAL Hepatica effectively and gently rids the bowel of injurious waste materials. Also, it acts to "save" and replenish plasma alkaline reserve. Resistance against many ailments is thus strengthened.

Sal Hepatica is effervescent and pleasing to taste. Its ingredients (their ratio and action) resemble those of famous mineral springs. Try Sal Hepatica clinically! Fill in and mail the coupon for samples and literature.

SAL HEPATICA CLEANS THE INTESTINAL TRACT AND COMBATS ACIDITY

BRISTOL-MYERS COMPANY, 1241-C BENOIT STREET, MONTREAL, CANADA

Send me without charge
professional package of
Sal Hepatica and
literature.

..... M.D.
(Please enclose card)
St. & No.....
City Prov.



STRESS

—Emotional, Toxic, Infective—
Must Involve the Endocrines

The close relation of metabolic activity, sympathetic balance, and endocrine function makes this claim inevitable. Hence asthenia, depletion, and cellular inadequacy are as obviously endocrine syndromes as Addisonism or myxedema. Two therapeutic procedures are imperative:

- (1) **Spare the endocrines—**
control the cause, neutralize the toxins, rest the body.
- (2) **Support the endocrines—**
especially the kinetic system (thyroid, adrenal cortex, brain, and muscles) with the original formula

ADRENO-SPERMIN

Available in sanitabets, capsules, and ampules.

The HARROWER LABORATORY, Inc.

Canadian Distributors:

WILFRED G. NOBLE, LTD.

64 Gerrard St. East - Toronto 2

*For Metabolism Studies and
Oxygen Therapy*

SODASORB

(An improved type of Wilson Soda Lime)

THE BEST ABSORBENT FOR CARBON DIOXIDE

For the past ten years, Wilson Soda Lime has been recognized by leading hospitals in America as the outstanding CO₂ absorbent for use in metabolism apparatus and the oxygen tent. Sodasorb, made according to the original Wilson formula, possesses all of the outstanding advantages of Wilson Soda Lime and in addition is even more efficient as an absorbent.

NON-DELIQUESCENT
MOST ECONOMICAL
MOST EFFICIENT
MOST ACCURATE

Please Write For Further Details

DEWEY & ALMY CHEMICAL CO.
of Canada Ltd.

Sales Offices and Warehouses:
National Terminal Bldg. - Montreal, Que.
Factory: Farnham, P.Q.

The protean manifestations of skin diseases

often blurred by
previous treatment

[case pictured resisted
treatment for 2 ½ years]



frequently baffle even the life long experience of the specialist with his microscope, culture media and other laboratory aids to diagnosis.

The busy practitioner, debarred from leisurely diagnosis, is driven by necessity to act quickly and prescribe treatment.

Obviously a polyvalent ointment must be of untold value in these circumstances.

MAZON

INDICATIONS

Eczema
Psoriasis
Alopecia
Ring Worm
Dandruff
Athletic Foot
And Other Skin Disorders

was designed to fulfill this function. It has the widest sphere of application in the treatment of skin diseases and is free from undesirable side action.



Complete elimination of
Psoriasis shown above
after 2 months' treatment
No Recurrence-5 Years

A distinct departure from other local treatments.

- READILY ABSORBED
- NON-STAINING
- NON-GREASY
- ANTI-PRURITIC
- ANTI-SEPTIC
- ANTI-PARASITIC
- NO BANDAGING IS REQUIRED

WE WANT YOU TO LEARN OF MAZON'S MERITS
Test it on the most refractory suitable skin lesion.

On Sale

Dependable Pharmacies

Distributors

Wholesale Druggists

Samples and literature on request

LAURENTIAN LABORATORIES, LTD.
560 DeCourcelles St.
Montreal, Que.

C-4-36

Gentlemen: Please send me FREE trial supply of Mazon and Mazon Soap.

Dr.

Address

City Prov.

Antiphlogistine

TRADE MARK

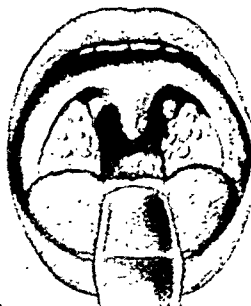
IN NOSE AND THROAT DISEASES



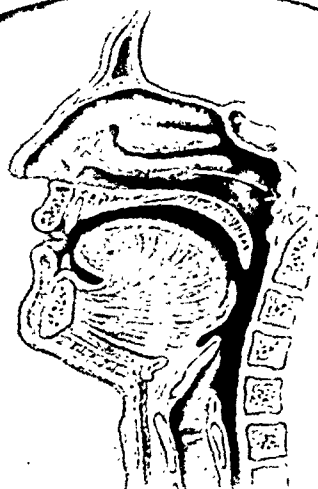
HOT, thick applications of Antiphlogistine—applied to the neck and, if necessary, entirely covering the neck from ear to ear—are of undisputed aid in effecting a reduction of inflammation and congestion in the pharyngeal and laryngeal tissues.

By providing continuous moist heat for anywhere from twelve to twenty-four hours, Antiphlogistine produces local arterial hyperemia... thus hastening the destruction of the organisms causing the infection and accelerating the processes of repair. Antiphlogistine also possesses analgesic and relaxing properties. It is absolutely non-toxic and non-irritating.

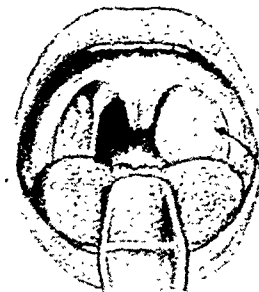
In nose and throat diseases such as those pictured... and in numerous other conditions... Antiphlogistine has been recommended for many years with uniformly favorable results. A sample of this plastic dressing, together with literature, will be sent you on request.



Tonsillitis



Nasopharyngitis



Peritonsillar abscess



The Denver Chemical Mfg. Co.
153 Lagachetiere St. W., Montreal

New Facts About Iron in Food

One of the most important dietary studies made in 1935 was that on the availability of iron in foods, reported at the eighty-sixth annual session of the American Medical Association, Atlantic City, June, 1935.

This study, covering nearly all the foods usually depended on for iron revealed the important fact that organic iron is assimilable only if soluble—and that in most foods only a part of the iron is soluble. For example, 100 grams of cooked egg yolk contain 4.80 mg. of iron—but only 1.02 mg. of this was found soluble.

The first paragraph of the report is important.

"A considerable proportion of the iron present in foods is in complex organic form. Recent clinical and experimental observations have shown that the iron in foods does not exert as great a hemoglobin regenerating effect as does the same amount of iron when fed as inorganic iron salts."

Reprinted from the Transactions of the Section on Pediatrics, American Medical Association, 1935.



Vip contains about 11 mg. of inorganic iron salts to each serving.

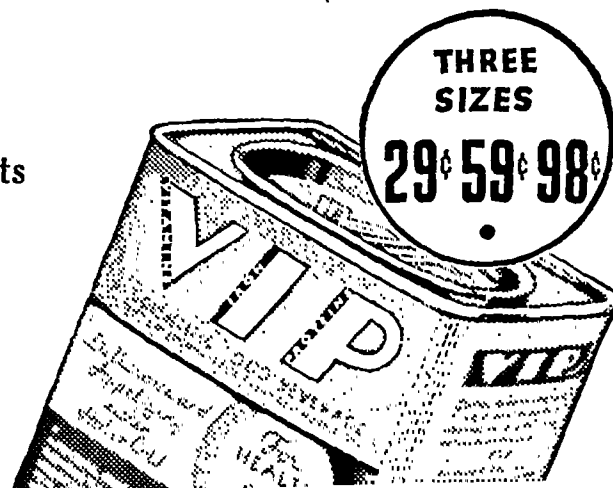
Because Vip is 27% wheat germ, it is also a rich source of vitamins B₁, B₂ and E. Because Vip is chocolate-flavoured and easily prepared, hot or cold, it is readily acceptable to patients, both child and adult.

In those cases where nutritional anaemia, underweight, nervousness or other symptoms suggest a dietary lack of iron or of the vitamin B complex, we suggest the daily use of Vip.

A trial tin of Vip, and literature, will be sent to any physician on request.

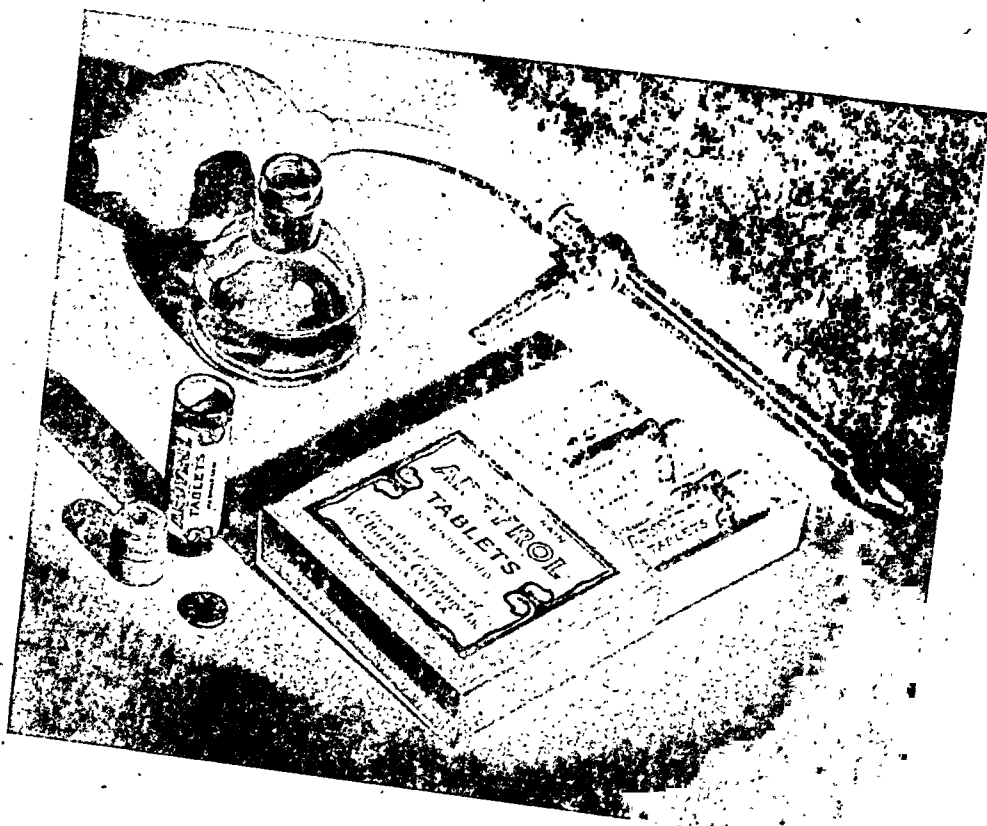
Scientific Food Products
Limited

255 Bay St., Toronto



Distributed by
W. Lloyd Wood
Limited
64 Gerrard St. E.
TORONTO

Spray Argyrol in Common Cold



At this time of year, with frequent exposure to cold and wet, the common cold takes on a more serious aspect. Tonsillitis, pharyngitis and sinusitis are frequent sequelæ when "dread Winter spreads his latest glooms".

The prevention of complications is the first aim of the physician. Early treatment with Argyrol not only attacks the infection right at its source, but also quickly relieves the acute distress in the respiratory tract.

The Dowling Argyrol pack and the Argyrol spray (20 per cent solution) have become standard therapy throughout the world. Rhinologists, following the Dowling technique, find the tampon saturated with

10-20 per cent Argyrol solution, the most effective when used as a local detergent and decongestive for the highly inflamed nasal tissues.

The new Argyrol tablets in small convenient vials are a great convenience in nose and throat practice. They not only insure accuracy, purity and genuineness, but also save time, because a fresh, potent solution is thus made available at a moment's notice, in the doctor's office, in the operating room and at the bedside. Four tablets dropped in one-half ounce of water make a 10 per cent solution in a few minutes; other strengths in proportion. Argyrol is a unique and original compound; no other silver salt is like it chemically.

A. C. BARNES COMPANY, LIMITED
STE-THERESE, P.Q.

For 33 years sole makers of Argyrol and Ovoferrin. "Argyrol" is a registered trade-mark, the property of A. C. Barnes Co. Ltd.

The Story of MEAD'S OLEUM PERCOMORPHUM

A NEW, ECONOMICAL, POTENT SOURCE OF NATURAL VITAMINS A AND D

OLEUM PERCOMORPHUM, or Percomorph Liver Oil, is the achievement of an intensive, 10-year investigation conducted in the research laboratories of Mead Johnson & Company to find a natural oil more potent in vitamins A and D than cod liver oil and less expensive to the patient.

The U. S. Pharmacopoeia (IX, 1916, and X, 1925) recognized cod liver oil as the oil from the livers of fishes of the family *Gadidae*. There being some 50 species in this family, in addition to the type species, *Gadus Morrhua*, our first studies were directed at the examination of the more important species classed as cod. It occurred to us that somewhere in nature there might exist a species, or a family, or an order of fish, the liver oil of which would make possible a mixture comparable with Oleum Morrhuae but higher in vitamin potency.

The study was then directed to other species. By 1927 we had quantitatively compared the antiricketic value of oils from 15 species of fish and 11 other oils and fats. This was the most extensive survey of vitamin D sources reported up to that time. Outstanding in this list was puffer fish liver oil with a vitamin potency 15 times that of cod liver oil. Puffer fish were not available in commercial amounts, but the fact that one species of fish yielded so high a vitamin store provided great stimulus to investigators.

We discovered that the potency of fish liver oils increases with the leanness of the livers. With this revelation, we began a survey of all available commercial fish, as well as of rarer species. Collectors were sent to distant continents and to the islands of the Pacific and Atlantic oceans. From ports which never before knew cold storage we arranged to obtain refrigerated livers for our experiments. This ichthyological survey was interrupted (1928) at the time we introduced activated ergosterol.

In 1929 the Norwegian investigator, Schmidt-Neilsen, reported halibut-liver oil to be superior to cod in vitamin A. Upon investigating, we felt then, as we do now, that while halibut-liver oil

marked a distinct advance it left much to be desired since it was perforce an expensive source of vitamin D. Hence it came to be used chiefly to supply vitamin A as a vehicle for viosterol.

Continuing the search for fish liver oils, by 1934 our laboratory staff had made thousands of bioassays of oils from more than 100 species to determine their vitamin characteristics. The results, reported in scientific journals in January and April 1935, were the culmination of a search literally of the seven seas.

With cumulative data on more than 100 species, it became evident that the fish belonging to the order known as *Percomorphi* differ from others in possessing, almost without exception, phenomenal concentrations of vitamins A and D. Thus we find liver oils which contain 50, 100, 500, and even 1,000 times as much vitamin A or vitamin D as average cod liver oil!

Percomorph liver oils are seldom equally rich in both vitamins. By skilful blending of the A-rich oils with the D-rich oils, a mixture is obtained which is about 200 times richer than cod liver oil in both vitamins A and D. As this concentration is so great that an ordinary dose of the oil could not be conveniently measured, we dilute the percomorph oil with approximately one volume of refined cod liver oil.

The resultant product is Mead's Oleum Percomorphum, 50%, which is 100 times cod liver oil* in both vitamins A and D. By a further dilution we obtain Mead's Cod Liver Oil Fortified With Percomorph Liver Oil, 10 times as potent as cod liver oil* in both vitamins A and D. Their respective potencies are 60,000 vitamin A units, 8,500 vitamin D units; and 6,000 vitamin A units, 850 vitamin D units (international) per gram.

Just as Oleum Morrhuae is a mixture of the liver oils of various cod species (cf. U.S.P. XI, 1935, p. 261) so Oleum Percomorphum is a mixture of the liver oils of various percomorph species.** The significant difference is that the improved product is 100 times as potent in both vitamins A and D.

Mead's Oleum Percomorphum, 50%, is available in 10-drop capsules, 25 in a box; and in 10 cc. and 50 cc. bottles. Mead's Cod Liver Oil Fortified With Percomorph Liver Oil is available in 3 oz. and 16 oz. bottles.

*U.S.P. XI Minimum Standard.

**Principally *Xiphias gladius*, *Pneumatophorus diego*, *Thunnus thynnus*, *Sterolepis gigas*, and closely allied species.

MEAD JOHNSON & CO. OF CANADA LTD., BELLEVILLE, ONT.

Please enclose professional card when requesting samples of Mead Johnson products to cooperate in preventing their reaching unauthorized persons

The Canadian Medical Association Journal



ANNUAL MEETING
Canadian Medical Association.
 June 22 - 26, 1936
 VICTORIA, B.C.

THE OFFICIAL ORGAN OF
THE CANADIAN MEDICAL ASSOCIATION
 AND ITS AFFILIATED PROVINCIAL MEDICAL ASSOCIATIONS

PUBLISHED MONTHLY BY
THE CANADIAN MEDICAL ASSOCIATION
 3640 UNIVERSITY STREET, MONTREAL

[PRICE SEVENTY-FIVE CENTS PER COPY]

[COPYRIGHTED]

TWO NEW 1936 BOOKS

DISABILITY EVALUATION—Principles of Treatment of Compensable Injuries.

333 Illustrations \$9.00

By EARL D. McBRIDE, B.S., M.D., F.A.C.S., Assistant Professor in Orthopedic Surgery, University of Oklahoma School of Medicine; Chief of Staff to Reconstruction Hospital, Oklahoma City.

The purpose of this volume is to interpret the physiological and mechanical alterations arising out of injury to the motor structures of the human body, and to reasonably appraise and evaluate the extent of functional loss as it relates to the economic incapacity of the injured. Enables you to determine, appraise and evaluate the difference between the person as he was before his injury and the variation from normal after recovery. It gives the extent in disability in terms of percentage of loss of the use of the body. It gives a short description of the law as regards disability awards in the various Provinces of Canada. All surgeons and insurance examiners will want this book.

HERTZLER'S SURGICAL PATHOLOGY OF THE GASTRO-INTESTINAL TRACT.

242 Illustrations \$5.00

This is another volume just issued in Hertzler's SURGERY PATHOLOGY SERIES. Others already issued are: Bones, Skin, Fascia, Muscles, Tendons, Blood and Lymph Vessels; G.U. Organs; Female Generative Organs; Mammary Glands; Peritoneum. Each reasonably priced at \$5.00.

J. B. LIPPINCOTT COMPANY, PUBLISHERS

**525 CONFEDERATION BUILDING
 MONTREAL**

THELESTRIN

OVARIAN FOLLICULAR HORMONE

A standardized preparation of the ovarian follicular hormone for intensive ovarian therapy by hypodermic injection.

Indicated in the treatment of scanty menstrual flow, amenorrhea and the vasomotor and nervous symptoms of the menopause.

Each ampoule contains 25 rat units standardized by the Allen-Doisy method.

•

Boxes of 6 1-cc. ampoules

•

G. W. CARNRICK CO., LTD.

20 Mt. Pleasant Ave.

Newark, N. J.

PNEUMONIA DEATH RATE CUT 77% . . . with SHERMAN VACCINE Formula "38"

**CLINICAL TESTS COVERING
EIGHT YEARS ON 956 CASES
DISCLOSE THESE STRIKING
RESULTS . . .**

Conducted By One of America's Most Renowned Clinicians

One of America's most eminent physicians set himself the task of making the most exhaustive tests on the efficacy of vaccine in the treatment of pneumonia. His work was complemented by several prominent clinicians in other parts of the United States. The variety of pneumonia types treated was so varied, the period of eight years' time so extensive and the results so uniformly dramatic that the findings disclosed "must certainly rule out as much as possible the element of chance."

*Findings Published in Bulletin of New York Academy of Medicine**

A complete review of the comparative tests of vaccinated and control cases treated together with a resume of the procedure, dosage, therapeutics and results on 956 cases used for observation provide a very impressive brief for the use of vaccine in the treatment of pneumonia.

Bellevue Hospital the Proving Ground

The extensive clinical work necessary to secure the impressive findings in this research was conducted at the

Bellevue Hospital, New York City. These findings are set forth in a condensed chart on this page. Concurrent clinical tests were likewise pursued at the Cook County Hospital by several very eminent physicians in Chicago and the results paralleled those in the east with startling exactness.**

Conclusions :

In eight years' time 474 patients with various types of pneumonia were treated with Sherman Pneumococcus Combined Vaccine Formula "38" at varying periods of time after the onset of the disease. These were compared with 482 controls. Result: Treatment commencing in the first 48 hour period reduced the death rate 77%. Where treatment commenced within first 72 hour period the death rate was reduced 59%. And in all other cases treated after 72 hours the death rate was reduced 32%. It is clear that a considerable premium is placed on the immediate stimulation of the protective mechanism of the body by injections of a proved vaccine.

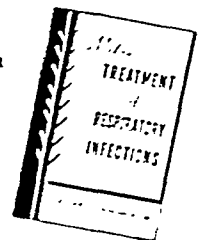
Table of Results				
	VACCINATED		CONTROLS	
	Total	Died	Total	Died
Cases treated in first 48 hours	97	9	97	39
Cases treated in first 72 hours	107	17	115	45
Cases treated after 72 hours	270	89	270	131
Total cases treated	474	115	462	215

*Lambert, Alexander: Bulletin, New York Academy of Medicine, June, 1933.

**Sutton, Don: Illinois Medical Journal, April, 1927.

Free to Physicians

This special book on the Modern Treatment of Respiratory Infections, including a digest of the papers referred to above, together with a 5 cc. vial of Sherman Pneumonia Vaccine Formula "38" mailed free on request.



G. H. Sherman, M.D., Inc.

Bacteriological Laboratories
14614 E. Jefferson Ave., Detroit, Michigan

G. H. Sherman, M.D., Inc.,

14614 E. Jefferson Ave., Detroit, Mich.

**PLEASE
USE THIS
COUPON**

Please send me free 5 cc. vial of Sherman Pneumonia Vaccine Formula "38" with special book on the Modern Treatment of Respiratory Infections.

Doctor

Address

City

Prov.

The Canadian Medical Association Journal

Editor, A. G. NICHOLLS, M.A., M.D., D.Sc., F.R.S.C., F.R.C.P.(C.)
3640 University Street, Montreal

Vol. 34

MARCH, 1936

No. 3

Contents

	Page		Page
Celiac Disease. <i>F. Shipman</i>	243	The Sex Hormones and Their Value as Therapeutic Agents. <i>M. C. Watson</i>	293
Endometriosis of the Large Bowel. <i>N. J. Maclean</i>	253	The Prolonged Toxic Effects of Local Anæsthetics: Cocaine, Novocaine, and Allied Drugs: Untoward Effects of Nembutal. <i>F. H. Wetmore</i>	299
Chronic Glanders. <i>J. F. Burgess</i>	258	Excessive Perspiration. <i>A. H. Pirie</i>	301
Tip of the Nose Completely Sectioned: Sutured Three Hours After the Accident. <i>J. N. Roy</i>	263	Industrial Tuberculosis in Montreal. <i>R. V. Ward</i>	303
The Rôle of Anatomy in the Radiological Study of the Spine. <i>W. A. Jones</i>	265	The Increased Incidence of Peptic Ulcers Among the Single Unemployed. <i>R. J. Brown</i>	306
Inguinal Hernia: With Special Reference to Sliding Hernia and a New Treatment. <i>L. S. Mackid</i>	269	The Choice of Treatment in Carcinoma of the Bladder. <i>R. Pearse</i>	308
Experimental Arsphenamine Dermatitis. <i>F. E. Cormia</i>	272		
The So-called Mosaic Fungus as an Intercellular Deposit of Cholesterol Crystals. <i>A. M. Davidson and P. H. Gregory</i>	277	CASE REPORTS	
Further Observations on the Antirachitic Effect of Irradiated Fresh Milk. <i>T. H. G. Drake, F. F. Tisdall and A. Brown</i>	279	A Case of Extreme Diffuse Dilatation of the Oesophagus. <i>W. O. Stevenson</i>	311
The Use of Strophanthin in the Treatment of Auricular Fibrillation. <i>H. E. Rykert and J. Hepburn</i>	281	A Foreign Body Trapped by Multiple Strictures of the Oesophagus. <i>J. G. Strachan</i>	313
Neurosyphilis. <i>J. C. Hossack and S. C. Peterson</i>	284	CLINICAL AND LABORATORY NOTES	
Primary Carcinoma of the Jejunum. <i>J. E. Plunkett, M. P. Foley and A. M. Snell</i>	289	A Modified Technique for the Reproduction of X-ray Films. <i>E. R. Secord, J. H. Moss and H. Diamond</i>	315
		The Atmospheric Pollen in Montreal. <i>H. E. MacDermot and G. R. Howell</i>	316
		Pituitary Spasm Removed by Adrenalin. <i>G. G. Copeland</i>	317

CONTINUED ON PAGE IV

MIDY'S PROVEINASE

REGULATOR OF THE VEINIOUS CIRCULATION

DISTURBANCES of the MENOPAUSE and at PUBERTY



2 to 4 tablets per day.

MIDY'S PIPERAZINE LABORATORIES, New Birks Bldg. MONTREAL

LABORATORIES MIDY: 67 Avenue de Wagram, Paris 17e. J. EDDE Limited, Montreal, General Agent for CANADA

For the early intensive treatment of syphilis

**NOVARSENOBENZOL
BILLON**

"The product with a tradition behind it"

To the physician conversant with the technique of intravenous injections, it provides the ideal and most energetic treatment of syphilis, particularly in its primary and secondary stages.

Offered in powder form only, in vacuum
sealed ampoules to maintain its chemical
integrity and its full potency

For treating syphilis Intramuscularly

**SULFARSENOBENZOL
BILLON**

Safe and effective antiluetic

A product that is particularly adapted for use in the treatment of children; in adults with inaccessible veins; in rural districts.

Supplied in progressive dosages of from
0.005 Gm. to 0.60 Gm.

Laboratory Poulenc Frères

OF CANADA LIMITED - MONTREAL

Distributors: ROUGIER FRÈRES - 350 Le Moyne Street - MONTREAL

CONTENTS CONTINUED FROM PAGE II

	Page		
EDITORIALS		UNIVERSITY NOTES	
King George the Fifth	318	Dalhousie	340
The Clinical Features of Coronary Disease	319	McGill— <i>Reorganization of the Medical Course</i>	340
Dominion Participation in Public Health	322	SPECIAL CORRESPONDENCE	
EDITORIAL COMMENTS		Edinburgh Letter	341
The Annual Convention in Victoria	323	London Letter	?
Regulations in Ontario for the Control of Tuberculosis among Nurses in Sanatoria and Public Hospitals	323	LETTERS, NOTES AND QUERIES	
Report of the Department of Health of Montreal, 1934	324	The Administration of Iron	24
SPECIAL ARTICLES		Some Practical Uses of Phenol	24
The Ethics of Medical Practice. <i>D. A. Stewart</i>	325	Extension of Travelling Privileges	24
Some Personal Impressions of the British Medical Association World Tour. <i>R. D. Rudolf</i>	326	TOPICS OF CURRENT INTEREST	
MEN AND BOOKS		Legislation Pending in Congress Concerning Food, Drugs, Cosmetics and Therapeutic Devices	345
History of the Canadian Medical Association, 1867-1921. A Review by W. B. Howell	330	Snow-Sedans	346
ASSOCIATION NOTES		MEDICO-LEGAL	
Federation	331	Davy v. Morrison	346
Constitution and By-Laws Applicable to Divisions	332	ABSTRACTS FROM CURRENT LITERATURE	
HOSPITAL SERVICE DEPARTMENT NOTES		Medicine	347
Surgery in the Small Hospital	337	Surgery	348
Are Blood Transfusions Worth While?	337	Obstetrics and Gynaecology	349
MEDICAL SOCIETIES		Pædiatrics	349
Canadian Public Health	338	Ophthalmology	350
Fredericton	338	A. E. Bedard	356
Montreal Physiological	338	J. E. Bergeron	356
Saint John	339	C. S. Brown	356
		D. M. Chisholm	356
		H. W. A. Colborne	356
		R. S. Frost	358
		W. E. Johnson	358
		J. A. Kearns	358
		A. E. Kelly	358
		J. A. Lawson	358
		J. D. Leeson	358
		S. H. McDonald	358
		D. H. Nichol	360
		J. T. Novinger	360
		C. O. Reist	360
		P. B. Robertson	360
		G. W. Somerville	360
		C. C. Tatham	360
		M. E. Thomas	360
		OBITUARIES	
		Canada	360
		Book Reviews	366

Printed by MURRAY PRINTING COMPANY, LIMITED, 192 SPADINA AVENUE, TORONTO 2.



NOVARSAN

*Obtainable in three
packagings to suit
your individual
requirements*

A CANADIAN PRODUCT

Novarsan Solution

Ready to inject.
Less toxic due to special solvent.
To be used within the 3 months
dating period.

Novarsan Powder

Absolutely stable.
Low toxicity.
As used by 20 independent
Departments of Health in the
British Empire.

Novarsan Combination

Absolutely stable.
Less toxic due to special solvent.
Easy to prepare—dissolve powder
in ampoule solvent provided.

NOVARSAN
NEOARSPHENAMINE

SYNTHETIC DRUG CO. LTD.
TORONTO
243 College St. Midway 8055

A Specific in **PREGNANCY**

to prevent
DENTAL CARIES

and to maintain
**CALCIUM
BALANCE**

"It is obvious, therefore, that appreciable amounts of Vitamin D are not furnished by our present diets."

"It is evident, therefore, that our whole modern method of living tends to diminish the Vitamin D effect of sunshine."

Tisdall, Frederick F.

C.M.A.J., Vol. 33, No. 6, Dec. 1935, page 625



OSTOGEN

in its most economical form

15 c.c. and 6 c.c. BOTTLES
with precision dropper

DOSE
2 to 6 drops daily

Charles E. Frosst & Co.

MANUFACTURING PHARMACISTS SINCE 1899

MONTREAL

CANADA

The Canadian Medical Association Journal

The Official Organ of the Canadian Medical Association and of all Provincial Medical Associations of Canada

Editorial Office, 3640 University St. - Montreal

CENTRAL EDITORIAL BOARD

Editor, A. G. Nicholls, M.A., M.D., D.Sc., F.R.S.C., F.R.C.P.(C.)

Assistant Editor, H. E. MacDermot, M.D., F.R.C.P.(C.)

Managing Editor, F. S. Patch, M.D.

Maude E. Abbott; E. W. Archibald; A. T. Bazin; F. G. Finley; A. Grant Fleming; D. Selater Lewis;

C. F. Martin; J. C. Meakins; L. C. Simard

CORRESPONDING MEMBERS

J. W. Crane; P. C. Dagneau; N. B. Dreyer; J. G. Fitzgerald; J. Miller, Ross Mitchell; Alan Rankin.

CHAIRMEN OF PROVINCIAL EDITORIAL BOARDS

ALBERTA—G. E. Learmonth, Calgary.

NOVA SCOTIA—J. S. MacLennan, C. W. Holland.

BRITISH COLUMBIA—D. E. H. Cleveland, Vancouver.

ONTARIO—J. H. Elliott, Toronto.

MANITOBA—Ross Mitchell, Winnipeg.

P. E. ISLAND—J. A. McPhee, Summerside.

NEW BRUNSWICK—A. S. Kirkland, Saint John.

SASKATCHEWAN—Lillian Chase, Regina.

MEMBERSHIP including *Journal*, \$10.00. Subscription to *Journal* is \$6.00 and is limited to Libraries, Hospitals and doctors residing outside Canada. Volume commences with January and July Issues. Index in June and December Issues.

CONTRIBUTIONS

EXCLUSIVE PUBLICATION: Articles are accepted for publication on condition that they are contributed solely to this *Journal*. Arrangements for simultaneous publication may be made under exceptional circumstances.

COPYRIGHT: Matter appearing in the *Journal* is covered by copyright under the Copyright Act of 1921, but, as a general rule, no objection will be made to the reproduction in reputable medical journals of anything in these columns, provided proper credit is given.

MEMORANDUM FOR CONTRIBUTORS

MANUSCRIPTS: Should be *typewritten*, *double-spaced*, and the *original copy* submitted, otherwise they cannot be accepted.

REFERENCES: Should be arranged as follows:

In the case of a *Journal*: ROBINSON, A. L.: Exophthalmic goitre, *J. Am. M. Ass.*, 1919, **72**: 1327. The black face type (**72**;) stands for the volume. In a typewritten manuscript the volume number should be underlined.

In the case of a book: KLEIN: Micro-organisms of Disease, Macmillan, London, 1st ed., 1896, p. 151.

Bibliographies are tending to become so cumbersome that frequently the *Journal* has to omit them for lack of space. Contributors are asked to give only the most important references.

ILLUSTRATIONS: Will be paid for by us when satisfactory photographs or drawings are supplied by the author. Negatives are not acceptable. Each illustration, table, etc., should bear the author's name on the back. Photographs should be clear and distinct, preferably black and on glazed paper; drawings should be made in india ink on white paper. For illustrations requiring cuts the best copper plate is used and all are printed on glazed paper. The *Journal* reserves the right to limit the number of illustrations. Contributors are respectfully requested to limit illustrations to such as are absolutely necessary.

REPRINTS: These may be ordered by contributors from the printers upon the form submitted with the galley proof.

ADVERTISEMENTS

First advertising forms go to press thirty days in advance of the date of issue. In forwarding copy, time must be allowed for setting up and submitting proof. Advertising rates on request.

N.B.—We endeavour to exclude from our columns all unethical advertisements and appreciate notification from our readers relative to any misrepresentation.

CLASSIFIED ADVERTISEMENTS are payable in advance. To avoid delay in publishing, remit with order. Advertisements under the following headings cost \$2.00 for each insertion of 40 words or less, additional words 5 cents each.

WANTED: Apparatus, Assistant, Books, Location, Partner, Partnership, Situation.

FOR SALE: Apparatus, Practice, Sanitaria, Drug Stores.

THE SMOKE OF THE BRITISH EMPIRE

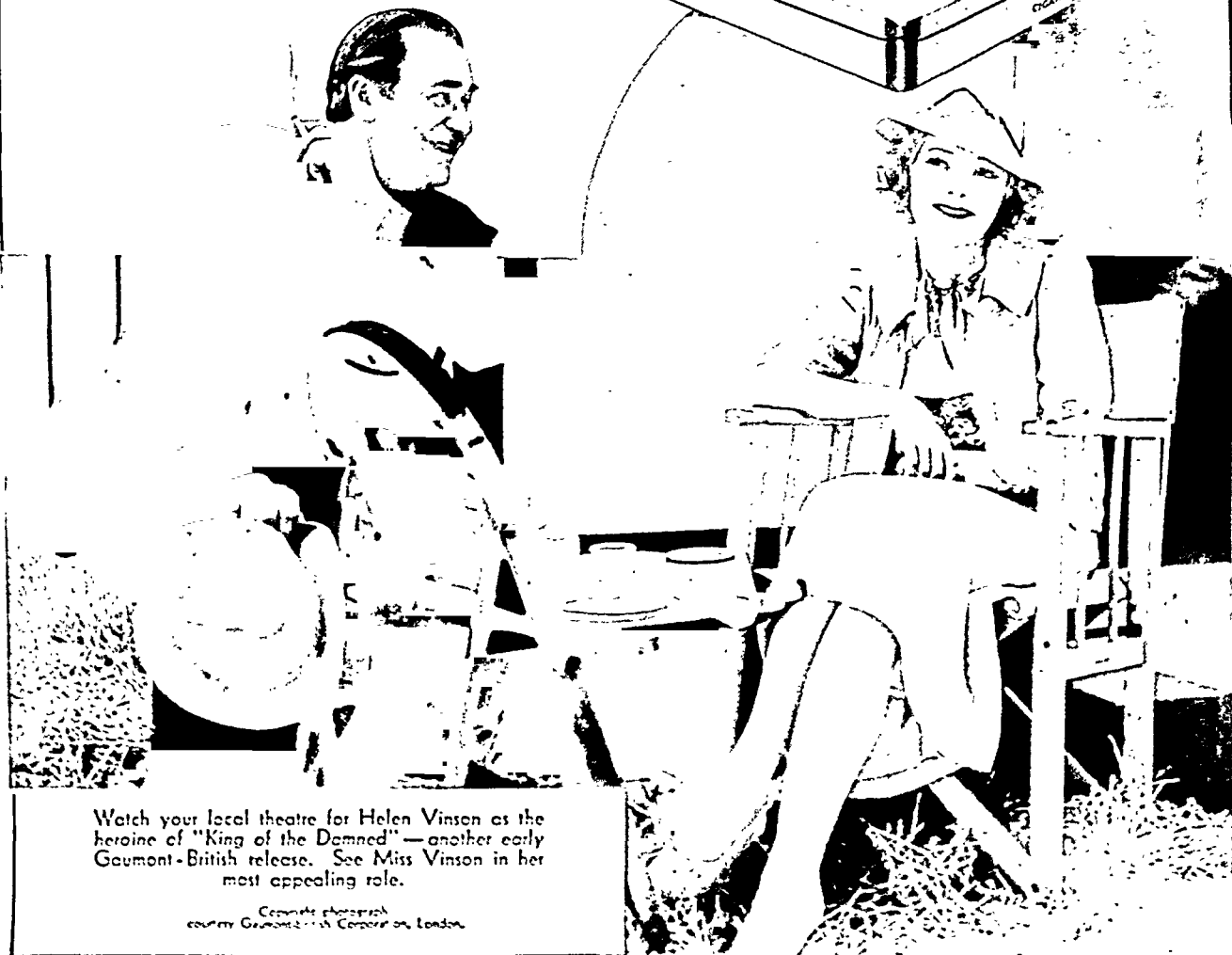
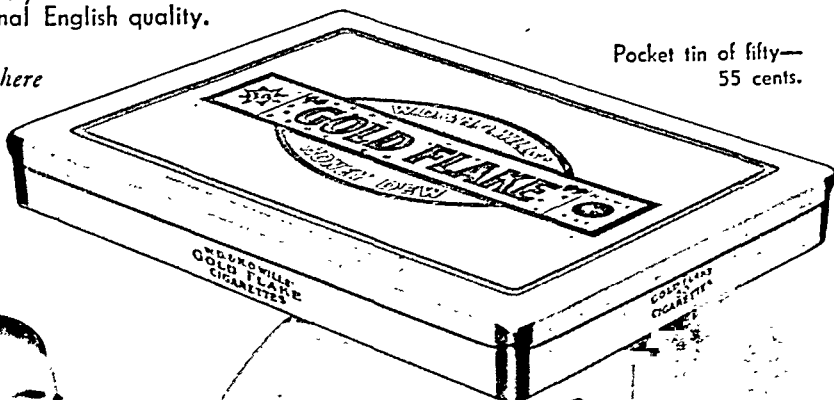
Helen Vinson—lovely and glamorous in so many of her roles—made her stage debut in a satire on "the movies"! When she broke into pictures she was given parts where her beauty and magnetic charm made her the irresistible enchantress.

Miss Vinson has a sunny and delightful personality and those working with her at the Gaumont-British studios have found her possessed of a really amusing sense of humour. Here she is seen outside her portable dressing room, sitting and smoking after tea with Noah Beery, during the filming of "King of the Damned".

Wherever you go on the Gaumont-British lot, you will find the stars showing a marked preference for W. D. & H. O. Wills' Gold Flake Cigarettes, because of their fine Virginia flavour and traditional English quality.

A shilling in London—a quarter here

Pocket tin of fifty—
55 cents.



Watch your local theatre for Helen Vinson as the heroine of "King of the Damned"—another early Gaumont-British release. See Miss Vinson in her most appealing role.

Complete photograph
courtesy Gaumont-British Corporation, London.

The Canadian Medical Association

Affiliated with the British Medical Association

Patron: HIS ROYAL HIGHNESS THE PRINCE OF WALES

President—J. C. MEAKINS, Montreal.

President-Elect—H. M. ROBERTSON, Victoria.

Chairman of Council—G. S. YOUNG, Toronto.

Honorary Treasurer—F. S. PATCH

Editor—A. G. NICHOLLS

3640 University Street, Montreal.

General Secretary—T. C. ROUTLEY, 154 College Street, Toronto.

Associate Secretaries—G. HARVEY AGNEW, Toronto; A. GRANT FLEMING, Montreal.

SECTIONAL OFFICERS

Section of Medicine

Chairman—D. GRAHAM, Toronto.

Secretary—K. A. MACKENZIE, Halifax.

Section of Surgery

Chairman—W. E. GALLIE, Toronto.

Secretary—A. R. MUNROE, Edmonton.

Section of Obstetrics and Gynecology

Chairman—J. FRASER, Montreal.

Secretary—D. C. MALCOLM, Saint John.

Section of Pædiatrics

Chairman—A. BROWN, Toronto.

Secretary—H. SPORN, Vancouver.

Section of Ear, Nose and Throat

Chairman—W. J. McNALLY, Montreal.

Secretary—W. HACKETT, Calgary.

Section of Eye

Chairman—W. G. M. BYERS, Montreal.

Secretary—A. R. CUNNINGHAM, Halifax.

Section of Military Medicine

Chairman—J. GUNN, Calgary.

Secretary—W. H. DELANEY, Quebec.

Section of Urology

Chairman—D. W. MACKENZIE, Montreal.

Secretary—E. R. MYERS, Saskatoon.

Section of Radiology

Chairman—W. A. JONES, Kingston.

Secretary—H. H. MURPHY, Victoria.

Section of Anæsthesia

Chairman—W. BOURNE, Montreal.

Secretary—W. L. MUIR, Halifax.

Section of Public Health and Industrial Medicine

Chairman—W. J. P. MACMILLAN, Charlottetown.

Secretary—A. G. FLEMING, Montreal.

Section of Historical Medicine

Chairman—W. W. FRANCIS, Montreal.

Secretary—H. E. MACDERMOT, Montreal.

Section of Pharmacology and Therapeutics

Chairman—V. E. HENDERSON, Toronto.

Secretary—G. F. STRONG, Vancouver.

Section of Pathology and Physiology

Chairman—WM. BORD, Winnipeg.

Secretary—C. H. BEST, Toronto.

Section of Nervous and Mental Diseases

Chairman—A. T. MATHERS, Winnipeg.

Secretary—W. V. CONE, Montreal.

Section of Dermatology and Syphilology

Chairman—J. F. BURGESS, Montreal.

Secretary—P. POIRIER, Montreal.

Section of Orthopædic Surgery

Chairman—R. I. HARRIS, Toronto.

Secretary—G. A. RAMSAY, London.

Section of Gastro-Enterology and Proctology

Chairman—R. H. M. HARDISTY, Montreal.

Secretary—J. K. MCGREGOR, Hamilton.

Section of Scientific Exhibits

Chairman—S. LEWIS, Montreal.

STANDING COMMITTEES

Inter-Relations Committee

Chairman—G. A. B. ADDY, Saint John.

Legislation

Chairman—G. D. STANLEY, Calgary.

Maternal Welfare

Chairman—W. B. HENDRY, Toronto.

Secretary—H. MACMURCHY, Toronto.

Medical Education

Chairman—E. S. RYERSON, Toronto.

Meyers Memorial Committee

Chairman—J. T. FOTHERINGHAM, Toronto.

Orations Committee

Chairman—J. C. MEAKINS, Montreal.

Osler Memorial Committee

Chairman—C. P. HOWARD, Montreal.

Pharmacy Committee

Chairman—V. E. HENDERSON, Toronto.

Central Program Committee

Chairman—A. PRIMROSE, Toronto.

Public Health and Medical Publicity

Chairman—J. G. FITZGERALD, Toronto.

Secretary—G. FLEMING, Montreal.

Revision of the By-Laws

Chairman—G. S. YOUNG, Toronto.

Royal College of Surgeons of England

Chairman—A. PRIMROSE, Toronto.

Study Committee on Cancer

Chairman—A. PRIMROSE, Toronto.

Study Committee on Nursing of the C.M.A. and C.N.A.

Chairman—G. S. CAMERON, Peterborough.

OFFICERS OF PROVINCIAL MEDICAL ASSOCIATIONS

Alberta

President—D. S. MACNAB, Calgary.

Secretary—G. R. JOHNSON, Calgary.

Associate Secretary—MR. W. G. HUNT, Calgary.

British Columbia

President—H. H. MILBURN, Vancouver.

Secretary—D. E. H. CLEVELAND, Vancouver.

Manitoba

President—G. W. ROGERS, Dauphin.

Secretary—F. W. JACKSON, Winnipeg.

New Brunswick

President—D. C. MALCOLM, Saint John.

Secretary—A. S. KIRKLAND, Saint John.

Nova Scotia

President—T. A. LEBBETTER, Yarmouth.

Secretary—H. G. GRANT, Halifax.

Ontario

President—A. J. MCGANITY, Kitchener.

Secretary—T. C. ROUTLEY, Toronto.

Prince Edward Island

President—V. L. GOODWILL, Charlottetown.

Secretary—J. W. MCKENZIE, Charlottetown.

Quebec

President—C. N. DEBLOIS, Three Rivers.

Secretary—L. GÉRIN-LAJOIE, Montreal.

Saskatchewan

President—H. H. CHRISTIE, Esterhazy.

Secretary—A. MACG. YOUNG, Saskatoon.

For names of Executive Committee and Council see alternate issues.

As a Routine Sedative--prescribe

BROMURAL

(bromisovalerylcarbamide)

A Quickly Acting Sedative and Hypnotic

5 grain tablets. Dose: as a sedative, 1 tablet repeated; as a hypnotic, 2 to 4 tablets.

Literature and Samples from

MERCK & CO. Ltd., 412 St. Sulpice St., MONTREAL - Selling Agents

Manufacturers: Bilhuber-Knoll Corp., Jersey City, N. J.

MARMITE

(REGISTERED TRADE MARK)

For the Maintenance of HEALTH

In a recent article (*Canadian Medical Association Journal*, Dec. 1935, p. 624) emphasis is placed on the inadequacy of the modern diet. Experiments are described indicating that there is a serious tendency to shortage of the Vitamin B complex—And the Vitamin B complex is known to play an important role in the maintenance of health.

Deficiency of Vitamin B is stated to lower resistance to infection and to be associated with various conditions of subnormal health—Marmite is one of the richest sources of both Vitamins B₁ and B₂ and for this reason, is frequently prescribed by physicians, especially during the influenza season.

In addition to the Vitamin factors, "Marmite provides a definite hæmopoietic factor which is not Vitamin B"—(*Lancet*, July 8th, 1933, p. 63)—Striking results have followed its use in certain forms of anæmia.



For sample and literature write

THE MARMITE FOOD EXTRACT CO., LTD.

Walsingham House, Seething Lane, London, E.C. 3.

or to

MacLAREN-WRIGHT, LTD.

-

69 Front Street East, Toronto

Canadian Distributors

Packed in jars—2 oz., 4 oz., 8 oz. and 7 lb. tins.

Special quotations for supplies in bulk to Hospitals and Institutions.



New!

A Silver Containing Ephedrine Solution:

Rx *Sol. Neo-Efemist 15* ^{cc.}
(Hart)

DEAR DOCTOR:

At this season of the year sore throats and colds-in-the-head increasingly demand your services. We respectfully direct your attention to NEO-EFEMIST (Hart), a really meritorious therapeutic agent for the localized treatment of these conditions.

The Silver Protein Mild, U.S.P., which this preparation contains has withstood the test of time against all newcomers as a superior agent for mucous membrane antiseptis.

The vasoconstrictor and decongestive action of the ephedrine sulphate contained in NEO-EFEMIST not only prevents undesirable diffusion of its contained silver, but also lessens systemic toxic absorption by greatly lowering permeability of the mucous membrane. Indeed, the early application of this preparation often succeeds in promptly checking the systemic symptoms of colds-in-the-head and sore throats.

If you have not already tried NEO-EFEMIST (Hart), send the coupon below to our Canadian representative for a complimentary bottle.

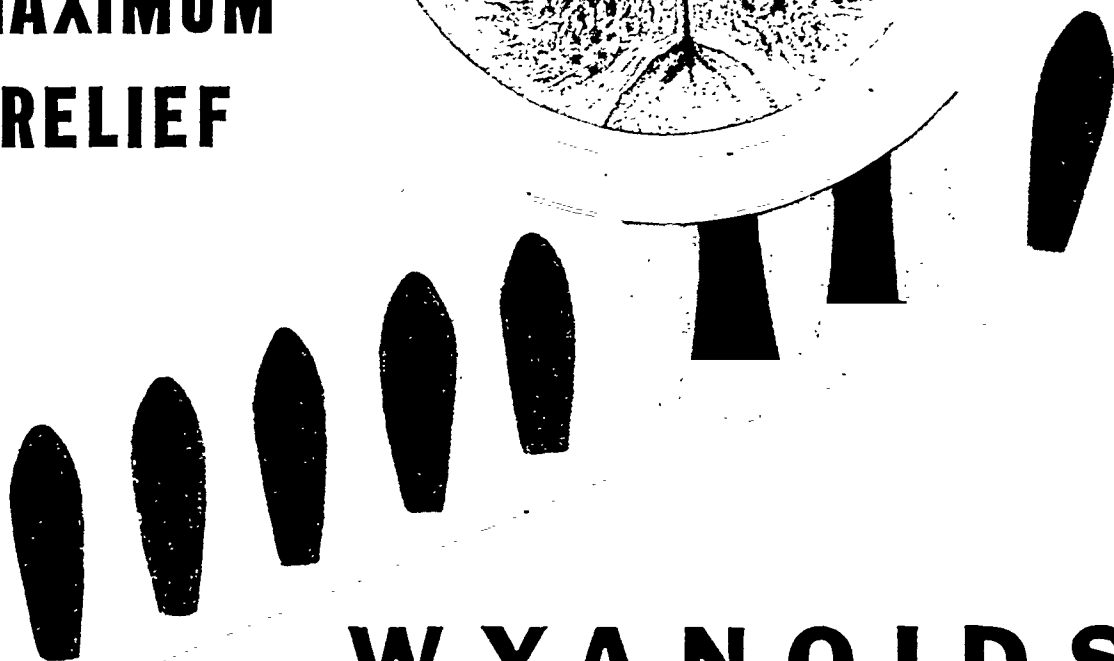
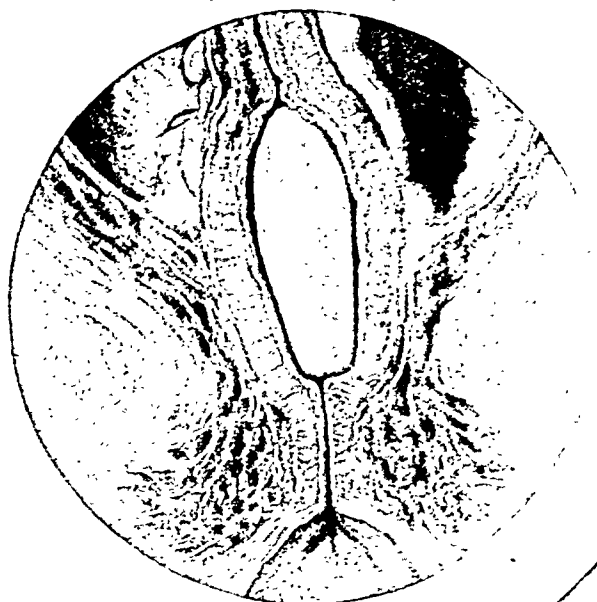
HART DRUG CORPORATION

LAURENTIAN LABORATORIES LIMITED,
560 De Courcelles Street,
St. Henry, Montreal.

Please send me complimentary bottle of NEO-EFEMIST (Hart) for clinical trial.

M.D.

**MAXIMUM
RELIEF**



WYANOIDS

(Wyeth's Hemorrhoidal Suppositories)

The unique torpedo shape of Wyanoids insures easy insertion, easy retention, maximum contact with the inflamed surfaces of the rectal canal.

Wyanoids are antiseptic, astringent, analgesic.

Allay inflammation; restrict bleeding; retard infection; properly control pain with



WYANOIDS

JOHN WYETH & BROTHER, Inc.

WALKERVILLE, ONT.

A Striking Advance in **VITAMIN D THERAPY**

*Complete solubility assures full consumption
of prescribed vitamin D dose*

The use of vitamin D preparations in oil is attended with certain disadvantages which now have been completely overcome by Drisdol (pure crystalline vitamin D) in Propylene Glycol. Clinical tests have shown that 2 drops of Drisdol in 1 quart of milk are sufficient for the prevention and cure of rickets . . . and, since it is priced the same as

Viosterol in Oil, its use is much more economical. Certainty of dosage is assured because Drisdol is distributed uniformly in milk, whereas oily preparations float on the surface and adhere to the sides of the nursing bottle. Drisdol in Propylene Glycol may also be given in fruit juices and other fluids without imparting an objectionable taste.

Supplied in bottles containing 5 cc. and 50 cc. Special droppers delivering 250 U. S. P. X-Revised 1934 vitamin D units per drop accompany each bottle.

DRISDOL

Trademark

Brand of Crystalline Vitamin D
in propylene glycol

• *Effective . . . Milk soluble . . . Economical* •

WINTHROP CHEMICAL COMPANY, INC.

Pharmaceuticals of merit for the physician

907 ELLIOTT STREET WEST, WINDSOR, ONT.

Factories: Rensselaer, N. Y.—Windsor, Ont.

Drisdol in Propylene Glycol dissolves completely in milk: No uncertainty as to consumption of vitamin D dose prescribed.



Vitamin D preparations in oil float on milk and adhere to glass and rubber: Serious doubt as to adequate antirachitic dosage.



FOR SUCCESSFUL BOWEL MANAGEMENT

5 Types of Petrolagar
TO FIT THE PARTICULAR
NEED OF THE PATIENT

1. Petrolagar-Plain:

A palatable emulsion of liquid petrolatum (65% by volume) and agar-agar. A rational corrective agent in the treatment of constipation.

2. Petrolagar with Phenolphthalein:

For obstinate cases of constipation. Contains $\frac{2}{3}$ grain of phenolphthalein to the tablespoonful.

3. Petrolagar with Milk of Magnesia:

For constipation accompanied by hyperacidity. Slightly more active than Petrolagar-Plain. Contains 8% Milk of Magnesia.

4. Petrolagar-Unsweetened:

For those who prefer unsweetened Petrolagar or for the patient with diabetic tendencies. Contains no sugar or assimilable carbohydrates.

5. Petrolagar with Cascara:

Indicated for the promotion of peristalsis and proper fecal consistency. More active than Petrolagar-Plain. Contains 13.2% non-bitter fluid-extract cascara sagrada.

Samples free on request

PETROLAGAR LABORATORIES OF CANADA, Ltd.

364 Argyle Road - WALKERVILLE, ONTARIO

• Petrolagar •

SCHERING

First in Sex Hormone Therapy



65,000,000 Rat Units
of the true follicular
hormone, *PROGY-
NON-B*, in crystal-
line form.

1st The Schering Laboratories were the first to perfect the highly potent and effective dihydro form of the follicular hormone—*Progynon-B*, the benzoic acid ester of dihydro follicular hormone. Extensive published reports by eminent workers reveal the efficacy of this material in the treatment of cases of follicular hormone deficiencies of the menopause, amenorrheas, dysmenorrhea, migraine, and gonorrheal vaginitis in children.

1st Schering was the first to synthesize and standardize the corpus luteum hormone. *Proluton* has shown itself to be singularly effective in the treatment of threatened and habitual abortion, metrorrhagia, and menorrhagia.

Greatly reduced prices place this valuable therapy within reach of more of your patients. The variety of concentrations make possible proper adjustment of dosage to the individual case.

*Interesting literature on Progynon-B
and Proluton sent on request*



WRITE FOR OUR NEW BOOKLET
"Clinical Guide for Female Sex Hormone Therapy"



SCHERING (CANADA) LIMITED

P. O. Box 358

MONTREAL



THE strength of a bank

is determined by its history, its policy, its management and the extent of its resources. For 118 years the Bank of Montreal has been in the forefront of Canadian finance.

BANK OF MONTREAL

Established 1817

TOTAL ASSETS IN EXCESS OF \$750,000,000

MODERN, EFFICIENT
BANKING SERVICE

. . . the outcome of 118
years' successful operation



**Use ANGIER'S to overcome the enervating
after effects of acute Winter ills such as - - -**

INFLUENZA - GRIPPE BRONCHITIS - PNEUMONIA

Following the use of Angier's Emulsion, the patient will observe a better appetite and digestion, a clearing up of the so called catarrhal conditions of both the throat and gastro-intestinal areas and a tonic strengthening effect.

Angier's is not a temporary stimulant but its effects are fundamentally sound and lasting.

Dose:—5 iv t.i.d. in either hot water, milk, orange or tomato juice.

WINGATE CHEMICAL CO. LTD.
378 West St. Paul St., Montreal, Que.

Gentlemen:— Kindly send me free sample of
Angier's Emulsion.

Name

Address

Sample on request.

Canadian Distributors:

The Wingate Chemical Co., Ltd.
378 West St. Paul St. - Montreal, Que.

*An important
to vitamin therapy . . .*

NAVITO

SQUIBB NATURAL VITAMIN OIL

GOOD GENERAL RESISTANCE and firm bone structure are depend in part upon an adequate supply of Vitamins A and D. Navito a new Squibb Vitamin Product—supplies these factors effective and inexpensively.

The vitamins in Navitol are obtained from *natural* fish liver sources. Navitol is as rich in Vitamins A and D as halibut liver with viosterol and yet costs 40 per cent less. It is convenient use and effective in small volume dosage. The oil contains per gram not less than 50,000 Vitamin A units, and 10,000 Vitamin D units. Ten drops (or one 3-minim capsule) supply 8500 Vitamin A and 1700 Vitamin D units, *International Units*.

Navitol is available as follows:

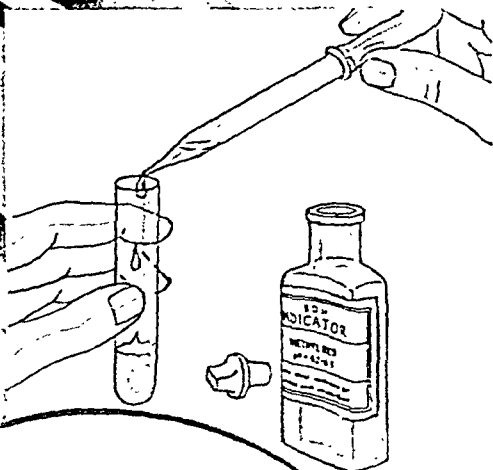
5-cc. bottle of oil (with dropper).....	\$.7
Box of 25 gelatin capsules.....	.8

*For further information write
Professional Service Department
36 Caledonia Road, Toronto, Ont.*



E. R. SQUIBB & SONS of CANADA LTD
Manufacturing Chemists to the Medical Profession Since 1858

MANDELIC ACID B.D.H.



In Urinary Infections

The use of Mandelic Acid B.D.H. in the treatment of urinary infections is now an established routine

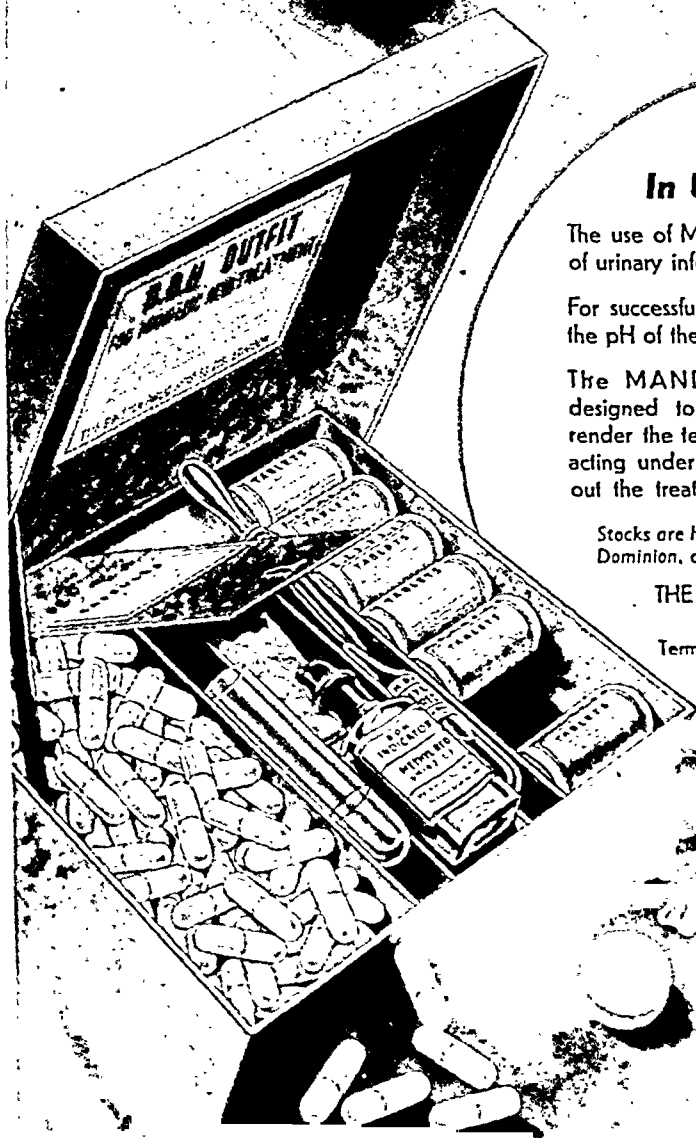
For successful treatment it is necessary to maintain the pH of the urine at 5.3 or lower

The MANDELIC ACID B.D.H. OUTFIT is designed to facilitate the treatment and to render the technique so simple that the patient, acting under the physician's instruction, can carry out the treatment himself

Stocks are held by leading druggists throughout the Dominion, and full particulars are available from

**THE BRITISH DRUG HOUSES
(CANADA) LTD.**

Terminal Warehouse Toronto 2 Ont.



The New General Electric MAXIMAR

**Self - Contained ★ Oil - Immersed
200 Kv. Therapy Unit**

Economical ★ Safe ★ Efficient

NOW, for the first time, the field of high voltage therapy can enjoy the advantages of equipment which incorporates the principle of complete oil-immersion. That means, with the entire high voltage system, including the x-ray tube itself, immersed in oil and hermetically sealed in a single grounded container, thus insuring complete safety against high voltage shock.

The MAXIMAR, this new General Electric self-contained, oil-immersed therapy unit, is both a logical and an epochal development. Logical, because it is evolved of the knowledge and experience gained by our engineers through fifteen years' application of this same principle to diagnostic

equipment. Epochal, because it brings to the radiologist equipment which offers features and advantages never before available in any other type of apparatus.

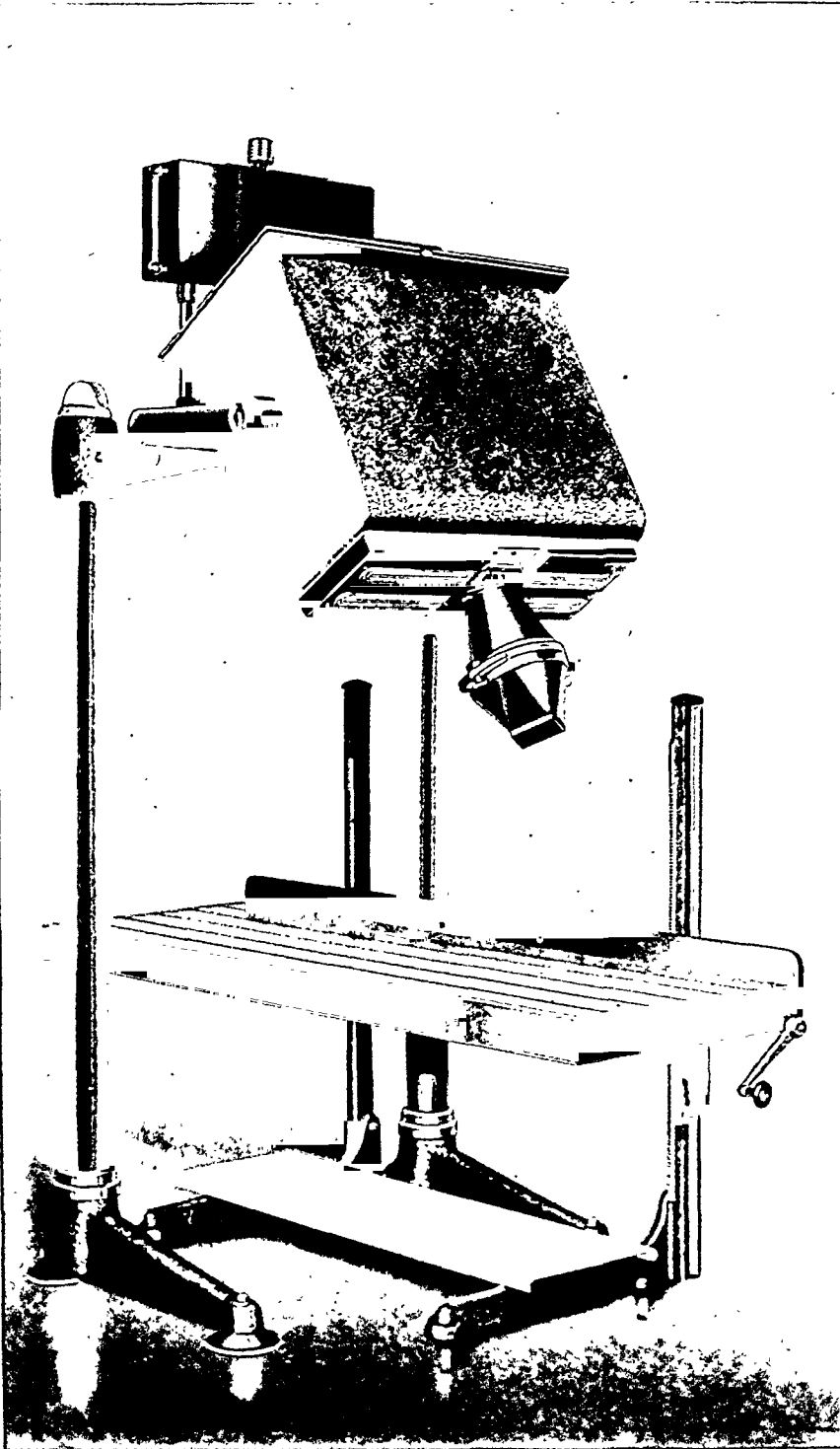
No longer must an institution forego the facilities for x-ray therapy because of lack of space or for economic reasons. The MAXIMAR Therapy Unit is a happy solution to the seemingly insurmountable problems of many institutions desiring such facilities.

No investigation is complete without all available information on the MAXIMAR Therapy Unit. Address Dept. A63, 2012 Jackson Blvd., Chicago, Ill., for your copy of the interesting descriptive bulletin.

Distributors: VICTOR X-RAY CORPORATION OF CANADA, LTD., Montreal, Toronto, Winnipeg, Vancouver



Development***



SALIENT FEATURES OF THE G-E MAXIMAR THERAPY UNIT

Completely Oil-Immersed —

Entire high voltage system, including the Coolidge tube, sealed in a single grounded container; operation therefore unaffected by climatic conditions or altitude.

Twice as Efficient

as half-wave equipment in "r" output per ma., due to the highly efficient circuit and a newly designed Coolidge tube.

Compact—Self-Contained—

A complete x-ray plant in itself, requiring only one small room, and operated from a control panel on outside wall. Minimum expense for lead lining of room.

Shock-Proof,

due to complete oil immersion. Eliminates the usual x-ray transformer room.

Flexible—

Readily applied to every type of treatment by simply angulating the tube head and raising and lowering the special table, with patient either prone or sitting.

Simple to Operate

The few controls required with this unit preclude the possibility of confusion on the part of the operator.

Reliable,

because of its consistent operation and consistent output of both quantity and quality of x-ray energy.

Easily Installed

in a few hours and ready for actual use.

Small Investment Required

The cost is so much lower than any other therapy equipment that it comes within the immediate means of practically every x-ray laboratory.

X-RAY CORPORATION

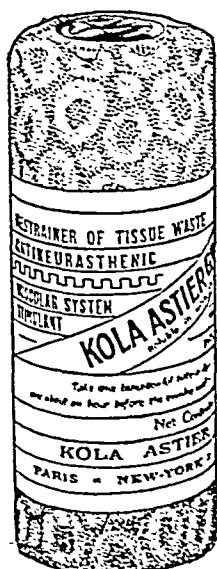
Effective and Dependable

General Stimulation

without

After-Depression

KOLA ASTIER
GRANULATED



Restrainers of Tissue Waste
Anti-Neurasthenic
Heart Regulator
Muscular System Stimulant

for

Cardiac Adynamia
Neurasthenia
Post Influenzal Asthenia
Post-Operative Shock
Senile Involution
Mental and Physical Overstrain
Convalescence

A large percentage of the cases treated by the general practitioner are of an asthenic type and call for the use of some supportive and stimulant treatment.

In all materia medica there is no drug that is better adapted to such a class of cases as Kola—the seed, or nut, of the *Sterculia Acuminata*.

The stimulation of Kola is peculiar in that it is tonic in effect and that, unlike that of ordinary stimulants, it is never followed by after-depression. Its co-operating tonic action maintains its beneficial stimulation.

In KOLA ASTIER GRANULATED, the physician has available to him in convenient form a skilfully prepared standardized extract, containing all the active principles of the Kola Nut: *Caffeine*, *Caffeine-Catechin*, *Theobromine*, *Kola-Red* and *Tannin*. Kola Astier is not habit forming.

Send for Literature and Sample

Agents for Ontario, the Western and Maritime
Provinces:

JOHN A. HUSTON COMPANY, LTD.

36-48 Caledonia Road - Toronto

Agents for the Province of Quebec:

ROUGIER FRÈRES

350 LeMoyne Street - Montreal



BELLERGAL



A CORRECTIVE OF NEURO-VEGETATIVE DYSTONIA

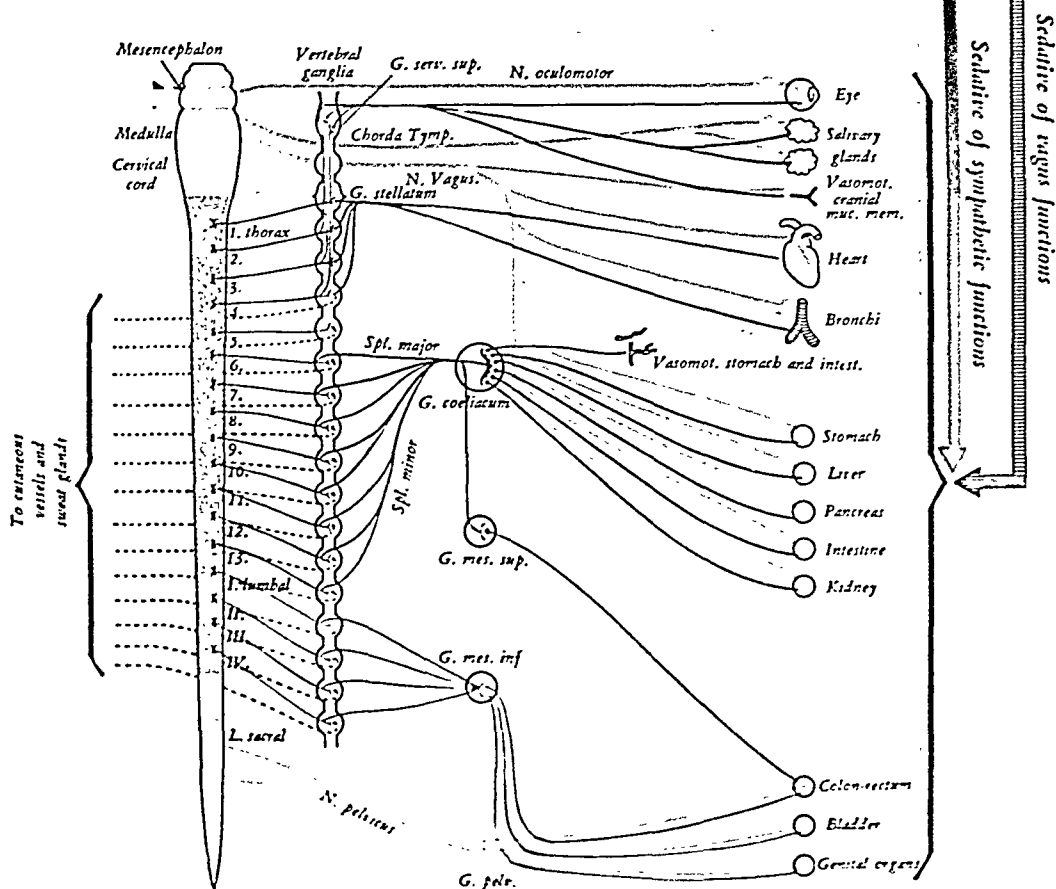
A pharmacodynamically balanced association of active neurotropic drugs, each tablet containing:

0.0001 Gm. 'Bellafcline' (brand of levo-rotatory alkaloids of belladonna leaves):

0.0003 Gm. 'Gynergen' (brand of ergotamine tartrate):

0.02 Gm. Phenobarbital: —

Sedative with central action

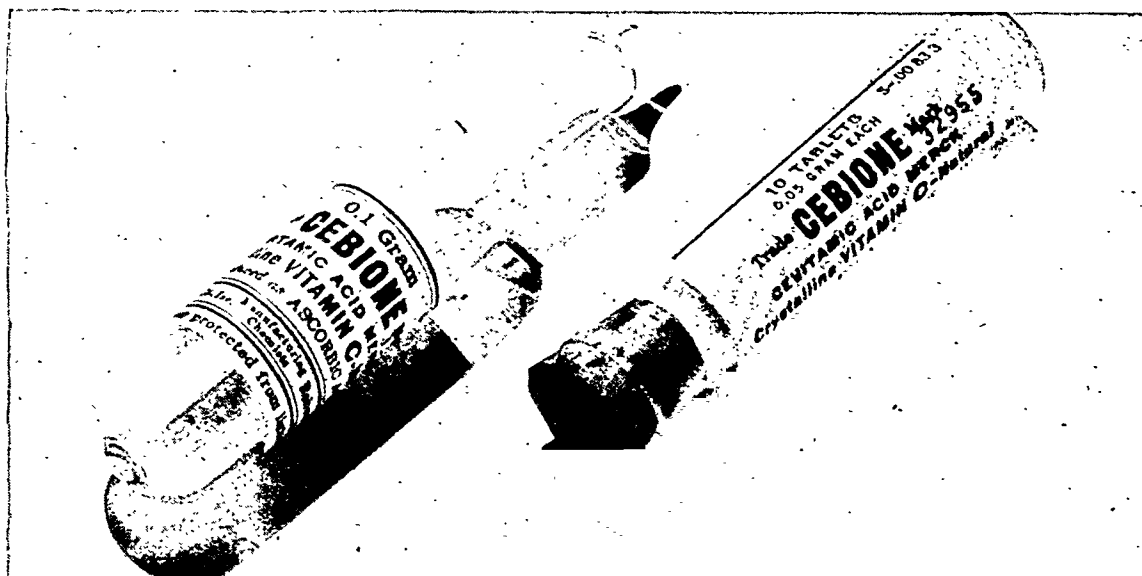


**Diagram of Nervous System (after Meyer & Gottlieb)
adapted to show pharmacologic action of 'Bellergal'**

Samples and Clinical Reports will be furnished on request.

WRITE

THE WINGATE CHEMICAL CO. LTD., 378 St. Paul St. W., Montreal, Que.



THERAPEUTIC INDICATIONS

Scurvy ☆ Prescorbutic Conditions ☆ Hemorrhagic Diseases due to C
 Avitaminosis ☆ Supplement to C deficient diets (Sippy, Ketogenic, etc.)
 ☆ Allergy to those fruits and vegetables containing Vitamin C ☆ ☆

Tablets for oral administration. Crystalline powder for preparing solutions for intravenous use.

AVAILABLE THROUGH THE DRUG TRADE ☆ LITERATURE ON REQUEST

MERCK & CO., Limited *Manufacturing Chemists* MONTREAL

STANNAXYL

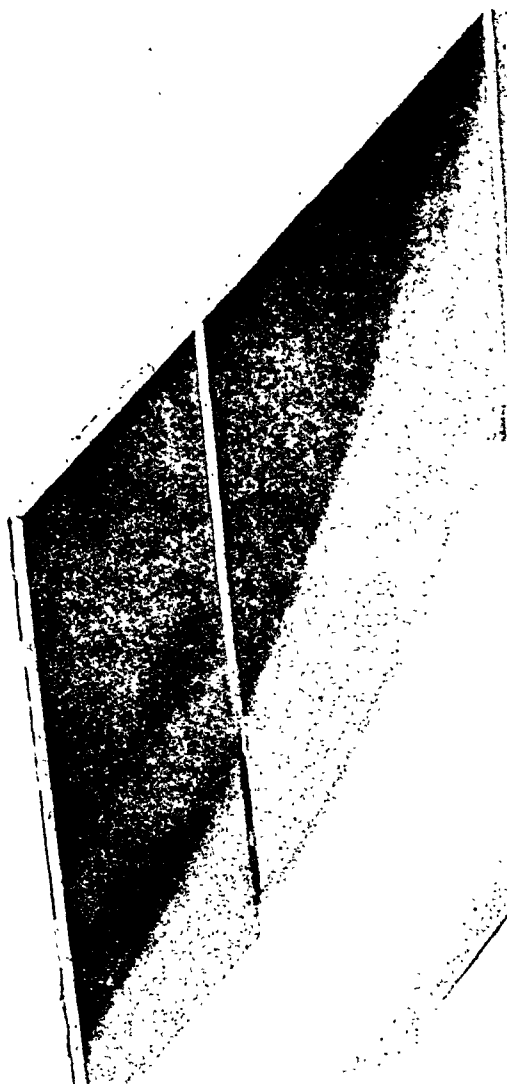
ORAL TREATMENT FOR BOILS ...



*SAMPLES
and
LITERATURE
ON REQUEST*



ANGLO-FRENCH DRUG CO.
354 St. Catherine St. E.
MONTREAL



but there's a big difference . . .

Shatterproof and ordinary glass look alike. But . . . the purchaser's safety may depend on the difference. Similarly, the difference between a full strength vitamin produce and one lacking in potency can't be told by appearance . . . nor by taste or weight.

The guarantee which accompanies each capsule of Abbott's Haliver Oil with Viosterol has back of it a series of accurate and conclusive assays, precise manufacturing methods and Abbott's complete control of every detail in the production. Whenever Vitamins A and D are indicated, consider the definite assurance of quality and potency which the genuine **Abbott's Haliver Oil with Viosterol** offers.

ABBOTT LABORATORIES LIMITED

Montreal - Canada

The Canadian Medical Association Journal

Vol. 34

TORONTO, MARCH, 1936

No. 3

CÆLIAC DISEASE

By FRED SHIPPAM, M.D., M.R.C.P. (EDIN.),

Montreal

CÆLIAC disease has been brought to our minds more forcibly of late because of the presence of three active cases in the children's ward of the Montreal General Hospital at the same time. The investigation of the case reports of these patients leads one to feel that in many instances too little "follow-up" has taken place. It must be realized that, at present, the outlook and subsequent cure of these cases depends wholly on the exactness with which the regulations of diet and vitamin administration are followed.

The history of the disease has been fully investigated by various authors. First described by Samuel Gee in 1888, several years of uncertainty followed as to the proper diagnosis of many of these cases. They were variously termed "cœliac disease", "chronic intestinal indigestion", "acholia", "intestinal infantilism", all titles that apparently gave importance to phases of the disease, according as they held the attention of the various investigators. As the years passed, the more recent investigators came to the conclusion that many of the former writers were describing the same thing under different names, so that at the present time the two most common titles used are "cœliac disease" and "chronic intestinal indigestion".

As far as can be gathered, the first case occurring in the English hospitals of Montreal was about 1923, but it was not definitely established then, and only on being followed up through subsequent years was the definite diagnosis made. Because of the lack of uniformity in naming this condition, the search for the records of past cases in the various hospitals before 1931 is practically hopeless and no further cases were discovered in that period. However, on conversing with the

various members of the staffs of these hospitals, they remember other cases which occurred then; which is probably explained by the lack of uniformity in classification and filing. The case in 1923 was the forerunner of others and some difficulty of diagnosis was encountered. Although the early treatment of this first case did not conform to our present ideas, the child survived. There was a gradual change to later methods of treatment, and when last heard of the child was well along the road to recovery.

Since 1931 some 13 other cases have been discovered. There was a space of some 35 years, from 1888 to 1923, before this disease began to make its presence noticeable in this city.

The onset of the disease is usually insidious, sometimes following some acute infection quite often associated with the alimentary tract. The usual age is within the first two years of life, often being about nine months. It has been very difficult to ascertain the average age of patients within the city, as the histories are very vague about the onset of the disease. Roughly speaking, it occurred at about twelve to fifteen months of age. It has been said that no case ever occurred during the period of breast feeding, whether due to the type of feeding or some special protection maternal milk gives has not been ascertained. Occasionally the onset is abrupt and of an acute type, with no history of previous infections.

Briefly, the characteristics of a fully developed case are those of a child stunted in growth, with a large protuberant abdomen, wasted body, muscles atonic and flabby, particularly the gluteals, loose wrinkled skin and usually in moderate to marked pallor. The child may or may

show signs of vitamin deficiency even though these have been included in the diet. The appetite varies markedly from time to time and the temperament alters with the progress of the disease. Perhaps the most outstanding clinical sign is large, profuse, frothy, foul-smelling, fermentative stools, sometimes putty- or porridge-like in consistency.

Considering in more detail the various clinical signs, the character of the stools seems to be the most striking, and this usually gives the key to the actual diagnosis. There are many milder cases that do not exhibit sufficient physical characteristics to make one sure of the diagnosis. The stools are usually frequent, although not always so, are very bulky, foul in odour and greyish or aluminum in colour. They sometimes weigh more than a pound, and this has been put forward by some as being the cause of rapid and marked variations in weight over a short period of time. Chemical analysis usually shows that the dried stool is made up of a large quantity of fat, sometimes as much as 50 per cent. The fat is usually properly emulsified and split up into neutral fat and fatty acids in which form it is normally absorbed.² Sometimes the stools do not contain quite this percentage of fat, but it is much over normal, always being more than 2 grams per day on a normal diet. This is the standard set for diagnosis by some writers. The stools of a normal child on an average normal diet, not suffering from diarrhoea or a known intestinal infection, should not contain more than 25 per cent fat and of this not more than 15 to 25 per cent neutral fat. The normal stool contains from 12 to 18 per cent ether-soluble substances which are made up of fatty acids, a little lecithin and a trace of neutral fat.³ The fat is made up of approximately 10 to 20 per cent neutral fat, 20 to 40 per cent free fatty acids, and 40 to 80 per cent saponified fat. The weight of a normal dried stool is usually about 10 grams, with a total fat of about 10 per cent or less.^{4, 5} The coeliac stool weighs from 20 to 30 grams with a total fat of from 20 to 50 per cent, neutral fat 10 to 25 per cent, and fatty acids 20 to 60 per cent. The saponified fat ranges from 30 to 70 per cent.⁶ Fatty acids are said to predominate during the diarrhoeal periods, and soaps in the formed stools of the non-diarrhoeal periods.

The figures obtained by us in the cases investigated showed a variation from 9.7 per cent to

54.6 per cent total fat, fatty acids from 34 to 64 per cent, and neutral fat from 36 to 66 per cent, our own figures being those of infants on a restricted fat diet. The cases in the Montreal General Hospital showed the widest variation. The lowest figure, 9.7 per cent total fat, was in a child on a restricted fat and carbohydrate diet who was hospitalized, carefully controlled, improving steadily, and rapidly losing signs of the actual disease. The highest figure, that of 54.6 per cent, was an older child of ten years, the condition having existed for many years with no previous home cooperation, bearing out the fact that the longer the existence of the disease, the slower the response to treatment, or at least the more advanced condition of the disease. This girl, also, as we shall see later, had a very low blood calcium, which no doubt was associated with the ordinary calcium and fat metabolic relationship, these two substances bearing a very necessary parallel in maintaining a normal blood calcium. The remaining figures were from patients who were on a modified or fat-free diet. Those investigating a far greater series of cases than ours report a normal splitting of fat in the stool, the average neutral fat being the same as normal children, less than 25 per cent, the saponified fat very slightly lower than normal, and the fatty acids correspondingly slightly higher.⁷ Thus we see that since coeliac stools contain so much fat there is something interfering with its absorption and this gives us another matter for consideration later, namely, that of the absorption of vitamins A and D, both of which are fat-soluble.

Cultures of the stools are consistently negative for any abnormal intestinal bacteria, and intestinal infection has been constantly ruled out as a causal factor.⁸

The next outstanding feature is marked malnutrition and wasting. The usual storage of fat in the various depots of the body is absent. The skin is flabby and lies in folds. There is little or no subcutaneous fat. The muscles are extremely atonic and the child develops a waddling gait, very similar to that in bilateral congenital dislocation of the hip. The bony framework is poorly developed. The weight chart is very irregular, varying markedly from time to time, and there may be a loss of as much as one pound in less than twenty-four hours without any noticeable upset, but where it went, and from

necessary to stimulate growth or to set in motion the various gland activities necessary for the production of growth.

The mentality of the child is on the whole normal. It may be a little delayed, but all give a bright, intelligent picture, especially when feeling well and progressing favourably. Some seem above normal, but we tend to associate mentality with the size of the child and we are frequently misled by this. Any delay is usually due to interference with schooling because of the child's poor health, but eventually they are well up to par and become fitted for their usual places in society.

I have referred previously to the temperament and disposition of these children. This varies considerably with the stage of the disease. When the children are doing poorly, they are very irritable, but as they respond to treatment so does their disposition improve, until later they become pleasant, amiable and responsive. This feature is very characteristic.

Many of these children show a varying amount of pallor. The mucous membranes are quite pale and appear anæmic, which leads one to investigate the condition of the blood, and one is not surprised to find an anæmia of varying intensity. When we consider the inability of these children to assimilate or absorb types of food very necessary to their normal development, and the necessity for restricting many of these desired foods, it would be surprising if such a condition did not develop. They usually show a microcytic hypochromic anæmia of the nutritional type, but occasionally, a macrocytic hyperchromic anæmia having similarities to the anæmia of pernicious anæmia.⁹ It differs from pernicious anæmia in that the indirect van den Bergh reaction is low, there is an absence of poikilocytosis, free hydrochloric acid is usually present in the gastric juice or returns on treatment, and the anæmia responds to marmite or vitamin B concentrates.⁹ This condition is more frequent in the cœliac cases of long-standing and where the treatment has been inadequate. Megalocytes appear in the blood smear and the red cells are larger than normal. As would be expected from the very poor absorption of fat from the intestine, the blood fat is on the low or low normal side, usually being about half the normal figure of 0.634 g. per 100 c.c. of blood. Cases investigated

gave a blood fat of about 0.360 per 100 c.c. of blood, and there was very little variation of this figure, even after a meal. All writers are agreed on this point.

In studying the various cases of cœliac disease it was noticed that any increase of carbohydrate in the diet caused an increase of diarrhoea of a distinctly fermentative type, and the child did poorly. This led to the belief that besides an intolerance to fat there was also an intolerance to carbohydrate. The sugar tolerance test showed this to be pronounced.¹⁰ Chart 2 shows the blood-sugar curves of some five or

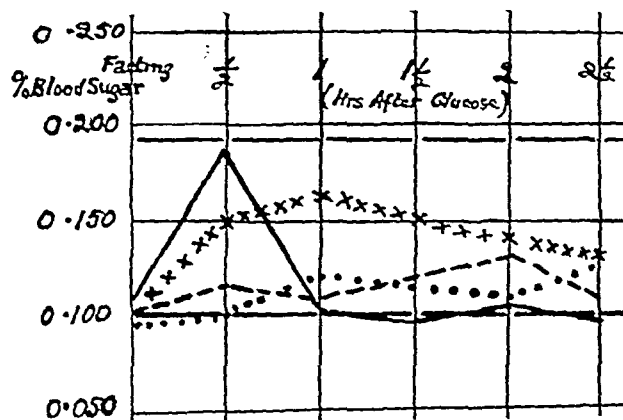


Chart 2.—Normal and cœliac blood sugar curves.

Cœliac child {
 - - - - 20 grams levulose in 50 c.c. water.
 - - - - 20 grams glucose in 50 c.c. water.
 x x x x 10 grams levulose with 10 grams glucose in 50 c.c. water.

Normal child ——— 20 grams glucose. Normal curve.
 Urine: no sugar at any time during tests. Shows evidence of delayed absorption and assimilation, but marked improvement when both sugars are used.

six cases in our series which agree with those carried out elsewhere. It indicates that there is a very slow absorption, and the curve is flat. The high peak curve is that of a normal child for comparison. It is therefore useless to combine large amounts of carbohydrate in the diet, for this not only sets up a marked intestinal upset but the bulk of it is not utilized. Some investigators have gone further than this and carried out sugar tolerance tests, using a mixture of dextrose and levulose in equal quantities, and have found that this gives a blood-sugar curve similar to that of normal children.¹¹ This feature indicates the reason for the popularity of ripe bananas in the treatment of these cases.

Vitamin A.—This is said to be a fat-soluble vitamin, but it is strange that in spite of marked intolerance to fat very few or no signs of deficiency of this vitamin exist in any of the cases, either amongst our series or that of any other writer. There is no reasonable explanation of this, unless it be that vitamin A is more

readily absorbed than the D factor. The late Doctor Hess has brought considerable experimental proof against the anti-infective properties of vitamin A, and deficiency of this vitamin therefore is not the explanation of the tendency to contract infections of the upper respiratory and intestinal tracts.

The study of vitamin B brings us to the consideration of two phases, (a) the signs of deficiency such as œdema of the feet and hands and the presence of free fluid in the abdomen, and (b) the occasional picture of a macrocytic hyperchromic anæmia. No signs of deficiency were seen in our own few cases, and we must quote other writers. Parsons¹² states that he has only seen the œdema when the child was passing through the diarrhœal stage, which was then likely due to some biochemical change and has been seen in cases of ordinary diarrhœa in infants, as well as in some cases of nutritional anæmia; others say that the œdema clears up rapidly with the administration of vitamin B, but do not state whether there is an accompanying diarrhœa.¹³ No changes of the blood picture were found in the series of cases of cœliac disease occurring in Montreal but a number were seen at the Birmingham Children's Hospital confirming this. Parsons has found that this macrocytic hyperchromic anæmia changes rapidly with the administration of marmite or vitamin B concentrate to a normal blood picture.^{6, 9} He also has found that a few do not change with marmite but do respond to the administration of desiccated gastric mucosa. It would seem therefore that there is not only a vitamin factor concerned in this but possibly an intrinsic factor as well.¹⁴

All of us assume that rickets is evidence of vitamin D deficiency, and since vitamin D is intimately associated with or dependent on the absorption of fat we should expect to find considerable evidence of rickets. Here again there is variance of opinion, and this has been due to the location at which the studies were made. Here in Montreal none of the cases studied showed any active rickets, but others have reported a fair percentage of these signs. It might be explained that during the periods of growth of our own cases, sufficient vitamin D must have been provided and, since there is a fairly abundant supply of sunshine, which has antirachitic properties, through a good proportion of the

year, this was very probably the explanation. During the winter months there was probably no growth or else the child obtained vitamin D from some other source, which was more of a happy coincidence than any prearranged plan. Birmingham reports 13 cases, but the writer has unpleasant memories of the many dark smoky days spent there. I saw a case of cœliac disease in a boy of nineteen years, in whom there was very marked rickets, both past and present. Thus climatic conditions have much to do with this feature, the other preventative factor being an inhibition of growth. The rachitic change is of the low calcium type as a rule; this is often a deficiency of the ionized calcium, for tetany is a feature that has been moderately common. One of our cases showed a calcium as low as 5.9 mg. per cent, with a phosphorus of 3.57 mg. per cent without any rickets and the child showing no signs of tetany nor any apparent hyperexcitability of the central nervous system. I am at a loss to explain this feature of this case.

X-RAY FINDINGS

In all diseases where there is a nutritional disturbance, whether this is a lack of the proper food or an inability to make use of or absorb this food, particularly in children, the imprint is left on the skeletal structure. The bones become rarefied and cast a less distinct shadow. There is also a decrease in the number of trabeculations, these being more loosely packed and therefore more distinct individually. The cortex is thinner than normal. This is said to be due to imperfect ossification rather than any washing out of calcium from the bones.¹⁵ Thus the bones are osteoporotic, atrophic, fragile, translucent, with a moderately thin cortex and an open trabecular mesh-work. Superimposed upon all this may be x-ray signs of rickets of any stage, varying from early onset to active, marked rickets. Ossification is sometimes delayed and several of the cases studied have shown this. Another feature said to be due to varying periods of inhibition in growth is the presence of transverse striations in the neighbourhood of the metaphysis. Thus with all these changes it is not surprising to find the occurrence of fractures, particularly in the rachitic cases. None of our cases showed any fractures, but many in the series showed the presence of fine transverse lines or striations.

Examination of the urine shows few changes from the normal. Indicanuria is found almost constantly, often quite marked, particularly in the severe wasting types. There is never any increase in sugar or albumin unless there is an associated disease of one or more of the organs of the body concerned with these features. In

since others have investigated and proved that bile is secreted normally and in abundant quantities.¹⁶

PATHOLOGY

We have had no pathological material up to the present and can therefore give no findings

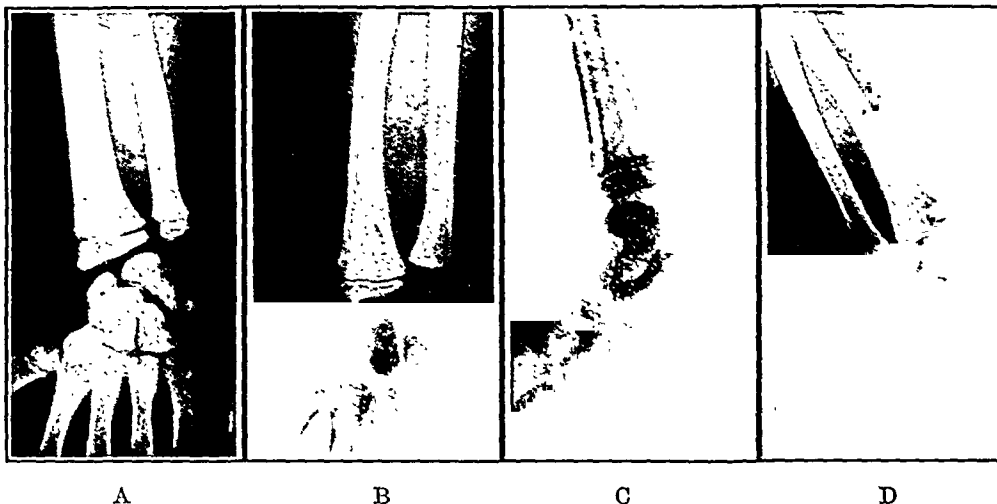
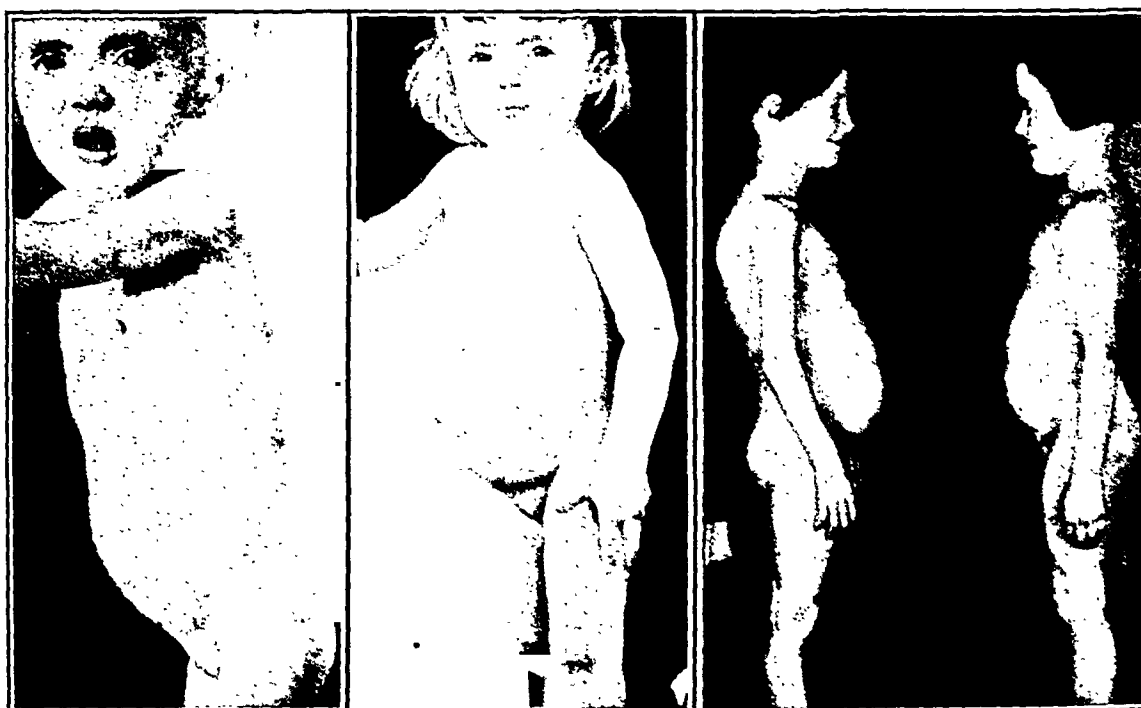


Fig. 1.—(A) Normal; (B) celiac showing transverse lines near metaphysis; (C) and (D) celiac, showing thin cortex, translucency and loose trabeculations.

the three cases admitted to the Montreal General Hospital, attention was directed by the resident on the ward to the absence of bile pigments in both the urine and stool. I am unable to explain what the significance of this is, particularly

of our own. Others who have been fortunate in this respect have found no abnormalities in any system as the cause of the disease. Whatever abnormal findings were present were a result rather than a cause.



A

Fig. 2

B

A

Fig. 3

B

Fig. 2. (Case 1).—(A) S.C., height 34"; weight 18 lbs. (B) Same child 4 months after treatment started. Weight 23 lbs. Note change in disposition. Fig. 3. (Case 2).—(A) Shows features of intestinal infantilism; (B) sister of A, normal child, aged 5 years.

To associate the previous remarks with actual cases the following illustrates briefly some of the outstanding features.

CASE 1

S.C., aged 2. (Fig. 2.) This was a little girl who was admitted with the complaints of irritability, vomiting, foul diarrhoea and poor development. It was noticed that at about eighteen months of age she developed a moderate upper respiratory infection, following which diarrhoea commenced. She did not do well from then on, irrespective of the amount of attention. She also became very irritable. The abdomen became larger, she grew weaker, and was no longer able to walk. The stools became large, very frequent, porridge-like and very foul. Up to the time of this infection she had developed normally. She was breast-fed for two months after birth and was then put on a cow's milk formula. She sat up at seven months, walked at fifteen months, and attempted to talk at eighteen months. She had had only a few colds up to that time. No cod liver oil or orange juice was given until fourteen months of age. There are eight other children in the family, all alive and well, and no other relatives are known to have any similar condition.

On examination she was found to be 34 inches in height, and weighed twenty-three pounds eight ounces. The abdomen at the level of the umbilicus measured 18 inches. The positive findings were a bluish tinge to the sclera of the eyes, a loose wrinkled skin, and practically no subcutaneous fat. The muscles were atonic and poorly developed, particularly the gluteals. The stools were large, foul and greyish. Cultures of these proved negative for abnormal bacteria. The stool was analyzed and showed a total fat of 24 per cent, neutral fat 48 per cent, and fatty acids 52 per cent. The urine and stool showed an absence of bile pigments with the Nayakama test. Indican was abundant in the urine. The blood showed red blood cells, 3,850,000; white blood cells, 10,600; hæmoglobin, 75 per cent. The smear showed small, pale, red cells with a picture of nutritional anemia. The blood calcium was 9.1 mg. per cent, and the phosphorus, 5.17 mg. per cent. The skiagram of the bones showed these to have a washed-out appearance, and a thin cortex with very loose trabeculations. The Wassermann test was negative.

This child did very poorly until a blood transfusion was given. There had been an initial fall in weight to 18 pounds, but after the transfusion she responded to the usual routine treatment. She recovered from chicken-pox while in the ward without difficulty and was transferred to a convalescent hospital weighing twenty-five pounds six ounces after five months of treatment.

CASE 2

M.P. (Fig. 3), aged 10 years. This child was brought to the hospital with the complaints of failure to grow, poor development, large abdomen and diarrhoea. All these things made their appearance gradually, but her mother stated that she had always been a small child and had had bowel upsets as early as her second year of life. She had never done well irrespective of any treatment given previously. She was first admitted to hospital in 1930 at the age of six years, weighing 20 pounds. The complaints were weakness and loss of strength. She was readmitted in 1931, aged seven years, with the same complaints and weighing nineteen pounds, four ounces. The stool analysis showed a total fat of 38.2 per cent, neutral fat 41 per cent, and fatty acids 59 per cent. The blood calcium was 9.1 mg. per cent and the phosphorus 2.6 mg. per cent, while the blood fat was 0.320 g. per 100 c.c. of blood. The skiagrams were reported normal. The patient was readmitted in 1933, aged 9 years, weighing twenty-three pounds, nine ounces, with similar complaints and practically the same findings. She made almost no response to treatment while in hospital. She was again admitted in September, 1934, aged ten years, and was found to be thirty-eight inches

tall, with a weight of twenty-three pounds, four ounces. She appeared thin, emaciated and pale. The sclera were blue, the skin loose, and the abdomen very protuberant, having a circumference of nineteen inches. There was marked muscular atony, the buttocks were poorly developed, and very little subcutaneous fat was present. The stools were large, porridge-like, greyish-brown, frothy and very foul. The total fat was 51.6 per cent, neutral fat 36 per cent, fatty acids, 64 per cent. Stool cultures were negative. The urine and stool showed an absence of bile pigments. The blood showed red blood cells, 3,290,000; white blood cells, 8,000; hæmoglobin, 51 per cent. In September there was a blood calcium of 7.8 mg. per cent, and phosphorus 2.5 mg. per cent. In October the calcium was 5.9, with a phosphorus 3.25. No increase in the amount of calcium in the blood was obtained with the administration of viosterol, even when given as high as 5 minims twice daily. In December, with the aid of the quartz lamp and calciphos "D" tablets, the calcium reached 9.8 mg. per cent, with a phosphorus of 3.5 mg. per cent. The blood sugar tests showed a hypoglycæmic curve. The Wassermann test was negative and skiagrams of the bones showed them to be washed out with loose trabeculations and a thin cortex, with a number of transverse lines near the metaphysis.

The child gradually improved in hospital on a low fat and carbohydrate diet, and was given as well the vitamins A, B, C and D in abundant quantities, with quartz lamp therapy twice weekly. She was discharged weighing twenty-seven pounds eight ounces, and has continued to gain under supervision in the Out-patient Department. She now weighs thirty-three pounds six ounces.

CASE 3

R.C. This child, aged two years, was admitted with complaints of diarrhoea, a severe cough and because of her dwarfed appearance. Three days before admission, she developed a severe diarrhoea associated with a marked cough. At birth she weighed eight pounds and was breast-fed for two months, after which she was admitted to the hospital for diarrhoea and cough. Apparently she did poorly, with no response to the treatment given, and stayed there eight months with no diagnosis being made. After her discharge she was kept at home, having frequent colds and numerous attacks of diarrhoea. Her weight remained stationary and her development was very poor. She was admitted to the Montreal General Hospital in September, 1934, and her examination provided the following positive findings. Her height was 28 inches, with a weight of fifteen pounds three and one-half ounces. The abdominal circumference was 18 inches. She appeared pale, small and stubby, but slightly fat. The abdomen was very prominent. The sclera were blue, the skin loose, and the muscles were very atonic. The stools were large, foul and pasty. Cultures of these were negative, and analysis showed a total fat of 9.7 per cent, neutral fat 46 per cent, and fatty acids 54 per cent. The urine and stool showed an absence of bile pigments. The urine contained an abundance of indican. Blood counts showed red blood cells, 4,300,000; white blood cells, 9,500; hæmoglobin, 80 per cent; and the blood picture was that of a nutritional anemia. The blood chemistry showed a calcium of 12.5 mg. per cent and a phosphorus of 3.75 mg. per cent. The Wassermann test was negative. X-ray showed the bones to be washed out, with a thin cortex, with loose trabeculae and several fine transverse lines near the metaphysis.

This child was put on the ordinary routine treatment of restricted fat and carbohydrate diet and gained steadily. She was transferred elsewhere weighing nineteen pounds four ounces, and has continued to gain up to 21 pounds whilst attending the Out-patient Department. She also survived an attack of chicken-pox without any upset.

ETIOLOGY

First, a consideration of the intestinal tract, which one suspects because of the usual diarrhoeal tendency, has resulted in a fruitless search. Cultural findings have been negative and no abnormality of any of the intestinal secretions has been found. Bile is apparently secreted in sufficient and normal quantities, and also is normal in character. Fat-splitting is found to be fairly normal, based more on other investigations than our own, but without sufficient variation to establish this as the cause. Enzyme action in the intestinal tract has been normal throughout, and since no positive findings were noted in the digestion and breaking up of the principal foods, carbohydrate, fat, and protein, one would suspect some defect in the absorptive mechanism.¹⁷ Constant search for this has revealed nothing, and the presence of a normal lacteal tree has been demonstrated by Doctors Neale and Parsons.¹⁸ Metabolic findings point a suspecting finger at both carbohydrate and fat, but these can reasonably be explained by defective absorption from the intestinal tract. Gastric secretions have been found to be normal and free hydrochloric acid has been found in fairly normal quantities. Defects in pancreatic activity both of external and internal secretion can be ruled out.¹⁹

Blood changes when present are seemingly the result of improper absorption of the necessary food substances, or are due to the fact that these foods cannot be given because of the danger of upsetting the child's digestion. There are so many defective links in the process of absorption of a diet that one would be surprised if changes in the blood were not present. The fact that the administration of vitamin B is capable of changing the macrocytic hyperchromic picture to a normal one in many cases, indicates a lack of this necessary factor somewhere in the diet, for the anaemia usually responds readily when vitamin B in a concentrated form such as marmite and bernal is given.⁹ Those that do not respond to this treatment react to desiccated gastric mucosa.²⁰ It must be remembered however, that the giving of these substances does not cause any change in the salient features nor in the general course of the disease, any more than the giving of orange juice when scurvy is superimposed on coeliac disease. Coeliac disease apparently is not a de-

ficiency disease, at least in so far as our present knowledge of vitamins goes. The administration of the various vitamins prevents and removes the superimposed characteristics of these deficiencies but does not cure coeliac disease.

A surmise as to the actual cause and eventual discovery of an active, rapidly, effective cure seems to centre interest on that point in the intestinal tract midway between the completion of digestion and the point of actual absorption. Whether this defect is anatomical or biochemical remains to be seen, but I believe that it will be to the biochemist that we must turn to find the ultimate cause and the resultant effective treatment. The fact is that over a long period of time with diet and vitamins as the chief weapons of attack the defect eventually rights itself slowly, and the body is able of its own power to remedy whatever may be the original cause. It is very probably due to a number of factors rather than one alone. Certainly the investigation of the child's history from birth to the onset of the disease does not give any clue regarding the specific cause, for the history does not differ in any one feature from that of hundreds of other normal children.

DIAGNOSIS

The important point, and one which will be found of most value, is a biochemical one. In the absence of any known definite infection, particularly of the alimentary tract, the stool of the coeliac child on a normal diet contains, on an average, more than two grams of fat per day.²¹ This fat is practically always normally split up into fatty acids and neutral fat. The neutral fat is usually not over 25 per cent of the total fat. Fat in the stool may be, as pointed out, a large percentage of the dried stool. I speak of this biochemical point first, because in the presence of a chronic diarrhoea in a child, where infection has been ruled out, an analysis of the stool will give a clue to the diagnosis long before the clinical picture presents itself. This picture develops gradually, becoming more characteristic with the advance of the disease, and it is not long before we have added to the biochemical findings a profuse, foul smelling, porridge-like stool, protuberant abdomen, atonic muscles, marked gluteal atrophy, general wasting, pallor and a repulsive, miserable disposition. The diagnosis at this stage, of course, is practically self-evident.

Tuberculous peritonitis, sprue, and infective diarrheas should be ruled out.

Briefly, the advanced case of coeliac disease is relatively easily diagnosed. The diagnosis of the early case is much more difficult, but if the problem is approached by securing early a stool analysis and culture, whenever there is the history of a stubborn, resistant intestinal upset, the task becomes much easier. Wherever possible, a sugar tolerance test tends to establish a more definite diagnosis. Coupled with this, the history of intolerance to fat carbohydrate foods and the usual anæmic features, with the occasional development of signs of vitamin deficiency, especially that of vitamin D, leads one to a more secure diagnosis.

TREATMENT

The first step is to put the child on a diet comparatively free from fat and carbohydrate, and easily tolerated. Skim protein milk best meets these requirements, and it is the first stage. It is made by adding calcium caseinate or protein milk powder, twenty grains to each ounce of skim milk, preferably dried skim milk solution. To make it more palatable saccharine may be added. The child will probably take the mixture much better if sweetened in this way. The patient is kept on this mixture until the stools become firm and few in number, preferably not more than one daily, and can be continued on this for weeks or months until the stool becomes formed. Next, proteins are added in the form of fat-free broth or bœuf, white of egg, curds made of skim milk, custard made without sugar and with skim milk, but very little egg. If tolerated, other foods are added slowly, such as the white meat of chicken or the meat of rabbit if obtainable. Keeping in mind the toleration of the child, the third stage is reached, that is, the adding of carbohydrates. The first carbohydrate added is that contained in ripe bananas, this being a 20 per cent carbohydrate fruit, the carbohydrate of which is levulose. Occasionally, carbohydrate is added earlier in the course of diet, being measured for convenience as one, two or three bananas, and so on daily. One may give up to eight or ten bananas daily, adding the extra ones slowly. As the child improves, the following may be added, twice-baked bread, zwieback, and later other carbohydrates and proteins, such as well cooked cereal, rice,

cheese and red meats. Peculiar mixtures are made up, but the child usually takes them with relish. The following diet is the one used in hospital and on which the children were discharged to attend the Out-patient Department regularly.

Breakfast.—Lean chicken, twice baked or toasted bread, whole egg, skim protein milk, sweetened with saccharine.

Dinner.—Soup—fat free, or bœuf, lean chicken, twice baked bread, purée of green peas, skim milk custard, cheese, skim protein milk, one banana.

Supper.—Twice baked bread, white fish or flannel haddie, skim milk custard, one banana, protein skim milk.

More bananas may be used than this diet contains. The patient for whom this was prepared had tired of so many bananas, which had been given for a long time previously, hence their limitation. The diet contained in all about 1,400 to 1,500 calories, and seemed to be well tolerated, with but one stool daily. This was about fifty to sixty calories per pound of body weight per day.

Vitamins A and D are essential and are given in the form of vitaminol, ostogen, ergosterol, etc. A solid vitamin D is preferable, if obtainable. Calciphos D is the only form at present manufactured in this country, so far as the writer is aware, and is a combination of the salts of calcium and phosphorus combined with vitamin D, each tablet containing some 1,250 vitamin D units. Frequent checks should be made of the blood calcium and phosphorus, and should these be low, the vitamins should be augmented by quartz or mercury vapor lamp treatments as often as may be thought necessary, usually two to three times per week, especially during the winter months.

Vitamin B, given in the form of "beminal" or "marmite", acts to improve the appetite and to prevent the onset of anæmia. It is readily taken by all patients. Marmite is a vitamin B concentrate made from yeast and malt extract containing both vitamins B₁ and B₂, and is very popular in England. It often forms part of the daily diet of children, being used frequently spread upon bread and butter. Beminal compound, an Ayerst McKenna and Harrison product, is a cereal concentrate containing vitamins B₁ and B₂, and is obtained from wheat germ and brewer's yeast. One and one-fifth grains of iron and one-twentieth grain of copper is added to each fluid ounce. Vitamin C in any form being readily tolerated is given as orange

juice and causes no digestive disturbance. In practically all cases it is necessary to supply iron, and this is given in the form of a ferro-catalytic preparation combined with beminal, or ferrum redactum, grain 1 daily.

The use of blood transfusions comes in at this point and it has been found to be of great service in many cases where all other measures have failed. Its effect has been striking and many patients who had a very grave prognosis can date the change toward improvement from the very day the first transfusion was given. It is particularly useful during the very severe stage of diarrhoea where the child is pale, listless, and exhausted from the frequent watery and profuse stools. It has seemed to be the one and only therapeutic agent which has given a change for the better, the final straw to which life has clung and found supporting. One of our patients, the only one who seemed to be *in extremis* showed a gradual but steady gain from the time the blood transfusion was given, all other measures having failed. The therapeutic effect of the blood transfusion is not wholly understood, but certainly, besides improving the anaemia, some factor seems to be supplied to the coeliac patient which has been missing. The results obtained are greater than those ordinarily obtained where increased blood volume and fluid alone are desired.

Finally the entire treatment requires patience, and one must not become discouraged, for there will be many remissions before the patient shows continued progress. Observations must be carried out for many years. General improvement manifests itself by an increase in weight and height without any increase of the abdominal circumference.

PROGNOSIS

What is to be expected of these children? How will they stand up in the place they will be expected to fill? In 1933, when reviewing these cases with the assistance of Doctors Smallwood and Neale under the guidance of Doctor Parsons, I saw a fairly large number who had been under treatment for a period of from eight to twelve years. All showed a very favourable outlook which was most encouraging when one considers the immense amount of care and work on the part of those who had watched and directed treatment. Many, in

fact all those old enough to work, were doing their full day's work. Less than 10 per cent had succumbed, and among these were many who had come for treatment in the worst stage of the disease.

CONCLUSION

In conclusion, all should be constantly on the watch for possible cases, and I am sure that many more will be found. After a diagnosis has been made the patients should be systematically followed and kept under constant supervision for many years. In the autumn and winter months especially, regular investigations of calcium and phosphorus content of the blood should be made, as it is not sufficient to give vitamin D and be content with that. As the case M.P. well illustrates, one may feel that everything necessary is being done for the well-being of the child, yet because of the poor absorption of fat, the desired effect is not secured, and response only obtained when the ordinary lines of treatment are augmented by quartz lamp therapy. With study, coeliac disease holds considerable fascination because of its great variety of aspects.

I desire to thank the Montreal General Hospital, the Children's Memorial Hospital, and Royal Victoria Hospital for their courtesy in making their records available to me. I have appreciated the cooperation and kindly suggestions of various members of the staffs associated with each hospital, particularly of the Montreal General Hospital, in permitting me to carry out many tests on these cases. The kindly cooperation of the departments of Biochemistry and Dietetics, and the X-ray Department of the Children's Memorial Hospital is greatly appreciated.

REFERENCES

1. & 2. PARSONS, L. G.: Coeliac disease, *Am. J. Dis. Child.*, 1932, 43: 1297 & 1302.
3. WRIGHT, S.: Applied Physiology, Oxford Medical Pub., 4th ed., 1932, p. 435.
- 4, 5, 6, 7, 8. PARSONS, L. G.: Coeliac disease, *Am. J. Dis. Child.*, 1932, 43: part 2—p. 1303. Chart 3.—p. 1303. Chart 2.—pp. 1302 & 1303. Charts 2 & 3.—p. 1303. Chart 3.—p. 1339.
9. PARSONS, L. G.: Anaemia in infancy and childhood, *Arch. Dis. Child.*, 1933, 8: 137.
10. PARSONS, L. G.: Coeliac disease, *Am. J. Dis. Child.*, 1932, 43: 1331.
11. MACLEAN, A. B. AND SULLIVAN, R. C.: Carbohydrate tolerance in infants and young children with coeliac disease, *Am. J. Dis. Child.*, 1929, 38: 16.
12. PARSONS, L. G.: Coeliac disease, *Am. J. Dis. Child.*, 1932, 43: 1309.
13. HAAS, S. V.: Beriberi in late infancy; the result of coeliac diseases, *Am. J. Dis. Child.*, 1929, 37: 1111.
14. PARSONS, L. G.: Anaemia in infancy and childhood, *Arch. Dis. Child.*, 1933, 8: 44.
15. TEALL, C. G. AND PARSONS, L. G.: Coeliac disease, *Am. J. Dis. Child.*, 1932, 43: 1313.
16. PARSONS, L. G.: Coeliac disease, *Am. J. Dis. Child.*, 1932, 43: 1336.
17. NEALE, A. V. AND KLUMPP, P. G.: Pancreatic investigation, *J. Clin. Invest.*, 1930, 9: 200.
18. NEALE, A. V. AND PARSONS, L. G.: Pathology of coeliac disease, *Arch. Dis. Child.*, 1928, 3: 176.
19. PARSONS, L. G.: Coeliac disease, *Am. J. Dis. Child.*, 1932, 43: 1333 & 1337.
20. PARSONS, L. G.: Anaemia in infancy and childhood, *Arch. Dis. Child.*, 1933, 8: 142.
21. PARSONS, L. G.: Coeliac disease, *Am. J. Dis. Child.*, 1932, 43: 1301.

ENDOMETRIOSIS OF THE LARGE BOWEL*

BY NEIL JOHN MACLEAN, M.D., M.R.C.S. (ENG.), F.A.C.S., F.R.C.S. (C.),

*Consulting Surgeon, Winnipeg General Hospital,**Winnipeg*

ENDOMETRIOSIS of the large bowel, though a rare condition, occurs with sufficient frequency to place it among the important benign lesions of the colon and rectum. During the past twenty years I have seen 6 cases of endometriosis of the large bowel, and during the same period 200 cases of carcinoma of the colon and rectum.

For half a century endometriosis under various names has engaged the attention of the medical profession, especially gynaecologists and pathologists. In 1860 Rokitansky¹ described "adenomyomata of the uterus". Subsequently tumours of endometrial structure were found involving various pelvic and abdominal organs, and it is these ectopic growths or implants, especially those involving the large bowel, that I wish to discuss.

An endometrioma may be defined as a tumour composed of aberrant endometrial cells which undergo periodic changes corresponding to the menstrual cycle. It may occur almost anywhere in the female reproductive organs, but has also been found in numerous other adjacent structures. Endometriosis is a term used to denote the presence of more than one endometrioma.

The nomenclature of the condition is extensive, and should be simplified. The following names occur in the literature:— (1) Adenomyom, (Rokitansky,¹ von Recklinghausen,² and others); (2) adenomyosis, (Fränkl,³ and the German school); (3) adenomyosis interna, (in the uterine body); adenomyosis externa, (for ectopic growths); (4) adenos, there being absence of muscle fibres in those occurring outside the uterus; (5) salpingitis isthmica nodosa (Chiari⁴), suggesting an inflammatory cause and originating in the Fallopian tubes:

(6) adenofibromyoma cysticum (Iwanoff⁵); (7) adenomyoma of endometrial type, (Sampson⁶); (8) müllerianoma and mülleriosis, (Baily⁷), suggesting an embryonal origin from the Müllerian duct; (9) endometrioma. (Blair-Bell⁸), or, if the "oma" suffix is objectionable, the more correct "osis" may be used; (10) endometroid tumours; (11) endometriosis, (Sampson⁹) a more correct term, considering there is usually more than one lesion.

Apart from the uterine body, where endometrial tumours occur most frequently, they have also been found (Fig. 1): (1) in the pouch of Douglas and recto-vaginal septum; (2) in the utero-vesical pouch (as bladder tumour); (3) in the isthmie angle of the tubes and uterus; (4) in and about the ovaries; (5) at the internal inguinal ring and inguinal canal; (6) at the umbilicus; (7) in the posterior sheath of the rectus muscle; (8) in the rectum and pelvic colon; (9) in the ileum; (10) in the appendix; (11) in the incisional scars of the abdominal wall, principally below the umbilicus, but very occasionally above it; (12) at the vulva and in a Bartholin gland (Duncan¹⁰).

CHARACTERISTICS OF ENDOMETRIAL IMPLANTS

Endometriomata occur in or on the organs of the female pelvis and certain nearby structures.

Inflammatory reaction, with fibrosis and adhesions, is a marked characteristic. Either two adjacent surfaces become sealed together enclosing the implant, as where the rectum becomes adherent to the posterior surface of the uterus, or the peritoneum, if mobile, may infold itself over the implant, thus surrounding and isolating it from the free abdominal cavity, as is seen in implants on the sigmoid (Fig. 3). This is an attempt of the peritoneum to extra-peritonealize the tumour. Harbitz¹¹ in his experimental work has noticed the same phenomenon occurring with implants in the pleural cavity and which he calls extra-pleuralization of the endometrioma.

* Presented at the joint meeting of the Canadian Medical and American Medical Associations in Atlantic City, Section of Gastro-enterology and Proctology, June 13, 1935.

It has been observed that ectopic endometrial implants occur most frequently in places where the peritoneum is folded irregularly, *e.g.*, (a) along the mesenteric attachment of the small bowel, (b) at the umbilicus, (c) internal inguinal ring, (d) on the anti-mesenteric border of the sigmoid where there are many folds of the peritoneum, (e) at the attachments of the epiploic appendices, and, (f) in the pouch of Douglas.

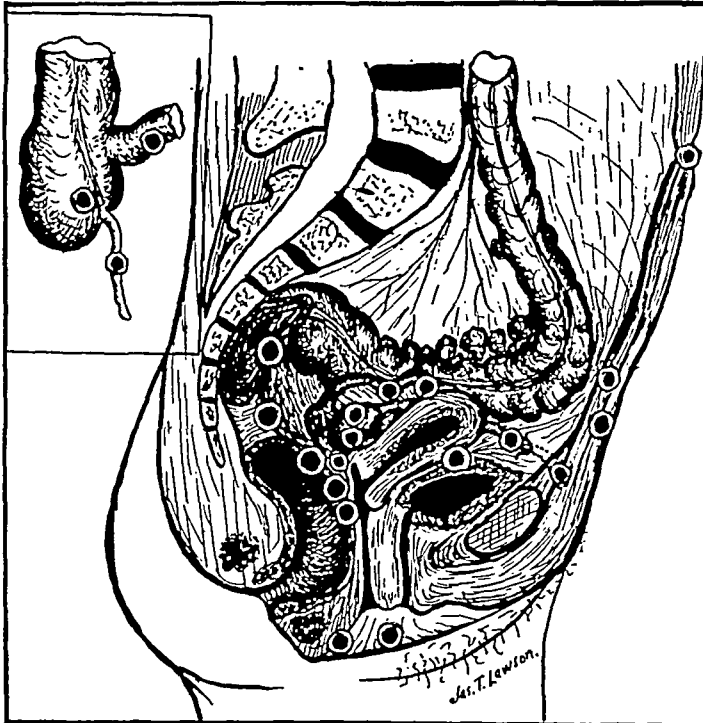


Fig. 1.—Showing the various locations in which endometriomata have been found.

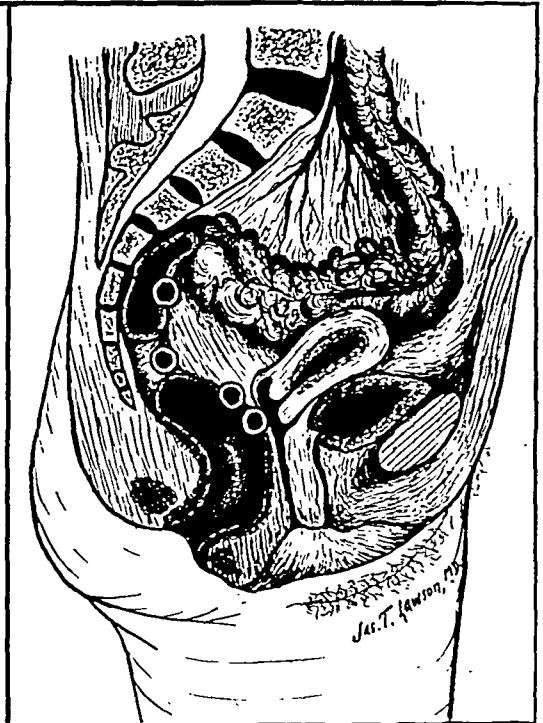


Fig. 2.—Showing the location at which endometriomata were found in my series, there being three at the lowest mark.

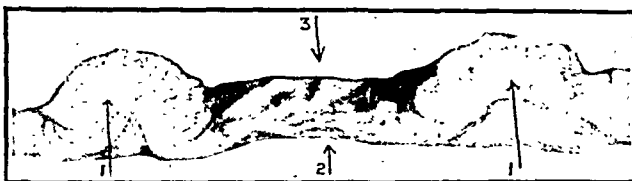


Fig. 3.—1. Endometriomata. 2. Serosa. 3. Mucosa. Segment of bowel removed showing two endometriomata. Note the great thickening of the musculature of the bowel wall, the intact mucosa, and the infolding of the serosa.

Increase in size at the menstrual phase, often with pain and sometimes bleeding, is a characteristic and suggestive feature. They have a marked resemblance to a malignant tumour. This has been noted by many writers on the subject and is a source of erroneous diagnoses. Endometrial implants have been found only in women.

THEORIES AS TO THE ORIGIN OF ENDOMETRIOMATA

1. *The inflammatory theory* (Chiari, 1887).—Chiari¹ in 1887 discovered an inflammatory condition in the tubes which he designated “salpingitis isthmica nodosa”, but which actually resembled adenomata because of proliferation of the tubal mucosa into the tubal wall. He, therefore, concluded that the endometriomata he observed were variations of the inflammatory process.

2. *von Recklinghausen's*² (1896) *Wolffian theory* was based on the fact that the Wolffian and Müllerian ducts cross each other at the isthmus portion of the Fallopian tubes. He thought this explained the fact that many endometriomata were found in this region. Support was lent to this view by the morphology of endometriomata, namely, their resemblance to the structure of the mesonephros, the cells being in clumps very much like the glomeruli of the kidney.

3. *The Müllerian theory* (Kossmann,¹² 1897). There are many advocates of the Müllerian theory. It is in essence, as is also the Wolffian theory—Cohnheim's theory of embryonic “cell rests”. In order to explain the bizarre distribution of these interesting growths one may find inspiration and some truth from a study of

the embryology of the parts involved. Arey in his introductory remarks to the chapter on the development of the urogenital system says, "The history of each system is complicated. Some organs result from the association of structures originally separate and even remote. Other parts appear, only to disappear after a transitory existence during which they may never have functioned. Still other structures designed for one purpose abandon their original destiny and are turned to new uses". When we consider the intimate and complicated relationship in the embryo between the Müllerian and Wolffian duct, the Wolffian body, the genital ridge, the urogenital sinus, and the hind gut, one can appreciate that here is a state of affairs par excellence for the fulfilment of the requirements of Cohnheim's theory of embryonic cell rests. If the Müllerian theory were correct we should expect to find endometrial tumours in both sexes, since in the early embryo the Müllerian duct is as large in the male as in the female. Of course, against this contention may be argued that the male does not possess the ovarian hormones which seem to have such a definite influence on the growth of endometriomata.

4. *Iwanoff's*⁵ (1898) *serosal metaplasia theory*, supported by Novak and Meyer, was based on the assumption that the coelomic endothelium, when inflamed or irritated could revert to the embryonic type and produce Müllerian tissue.

5. *Sampson's theory*.—Sampson⁹ argues that most endometriomata are due to implants of shed endometrium carried into the abdominal cavity via the Fallopian tubes during the menstrual cycle. One of the most important arguments in favour of this view is that endometriomata have been found to occur only in women. Experimental evidence in support of the theory is found in the work of Jacobson¹³ and of Harbitz,¹¹ both of whom have been able to produce in rabbits tumours similar to endometriomata by implanting endometrial cells in the peritoneal and pleural cavities. Many endometriomata are associated with chocolate cysts of the ovaries, the structure of which strongly resembles endometrium. It is readily seen that transplanted endometrial cells would easily find lodgement in the opening of a ruptured Graafian follicle. From this focus, once the cells have begun to grow, the endo-

metrial cysts thus formed may rupture and give rise to intra-peritoneal implants.

Arguments against Sampson's theory are based on the finding of endometriomata in sites apparently quite outside the peritoneal cavity, e.g., in the inguinal region, at the umbilicus, in the recto-vaginal septum, and at the vulva. I believe that growths even in these remote and unusual situations can be explained by Sampson's theory, which is more, I think, than he himself admits.

Those occurring in the inguinal region have in all probability been lodged in a patent peritoneal pouch covering the round ligament (canal of Nuck). We are all familiar with the view that such pouches may exist unrecognized for years, until some sudden muscular strain results in a herniation of bowel or omentum into the already patent sac. As it is characteristic of endometrial cells to set up an intense inflammatory reaction the canal would become obliterated by the abnormal cellular invasion. Likewise, an endometrial tumour at the umbilicus may be an implant into the sac of an umbilical hernia, such hernias being often small and unrecognized. Dr. A. G. Meindl, in excising an endometrial tumour in this region, had to repair an associated umbilical hernia.* A number of cases of endometriomata occurring in hernial sacs have been quoted by Harbitz.¹¹

Tumours of the recto-vaginal septum are probably due to deposits in a low pouch of Douglas; the tumour as it develops produces a peritoneal reaction which seals off the lower end of the pouch. The pouch of Douglas may extend deeply between the vagina and rectum, in fact, in the embryo it reaches the female perineum. A tumour occurring in an abdominal incisional scar is undoubtedly due to the accidental implantation of cells during operation, and an endometrioma at the vulva may readily be due to implants on a traumatized area, the trauma being due to an abortion, confinement or operation.

As I said at the beginning, I have seen in all 6 cases of endometrial tumours of the rectum and colon. Three of these involved the recto-vaginal septum, 2 the recto-sigmoid, and the sixth had two tumours situated respectively in the upper part of the rectum and in the lower

* Personal communication.

part of the sigmoid (Fig. 2). In addition to these I have seen or discussed with my confrères several other cases.

Dr. John C. Armour, of Montreal, wrote me of a patient he operated on with a partial obstruction of the ileum due to an endometrial tumour.* Through the courtesy of Dr. Daniel Nicholson I saw a specimen of an appendix containing an endometrial tumour. The patient had periodic intestinal hæmorrhages which ceased after surgical excision of the appendiceal mass. Dr. A. G. Meindl kindly showed me a tumour of the umbilicus which he removed and which had bled with each menstruation. Microscopically, it consisted of endometrial structure embedded in fibrous tissue. Dr. C. B. Stewart stated that he saw two cases of endometriosis of the bladder in Ringlab's Clinic in Berlin. From a study of this subject I was able to tell him where they were situated, namely, on the posterior wall of the fundus of the bladder, due to implants in the uterovesical pouch. A similar case is recorded by Henriksen,¹⁴ and others by Keene and Norris.¹⁵

DIAGNOSIS OF ENDOMETRIOMA OF THE LARGE BOWEL

The cardinal point in the history of all these patients, the one that should always suggest the possibility, is that the symptoms are greatly intensified during the menstrual period. The history in a given case depends on the situation of the tumour. Since we are dealing with the large bowel, the symptoms will be vague abdominal pain, perhaps accompanied by lower abdominal cramps, constipation, or, if the lesion is in the recto-vaginal septum, pain on defæcation. All these symptoms are worse at the time of the menstrual period, and indeed may be entirely absent between periods. Complete intestinal obstruction due to endometrial implants is a very late and exceedingly rare occurrence.

In all these cases the abdominal pain and constipation suggest carcinoma of the colon. A mass may be felt on rectal or abdominal examination, which will lend support to the diagnosis suggested. A tumour in the recto-vaginal septum can be felt in the posterior vaginal fornix as well as on rectal examination. If examined through the vaginal speculum a bulging only may be seen, or some puckering of the

mucosa, or one or more submucous nodules, which may be bluish in colour, due to their content of old menstrual blood. Investigation by the sigmoidoscope fails to confirm the suspicion of carcinoma, because endometrial implants are generally small and, unless seen at the time of the menstrual cycle, produce only an insignificant bulging of the bowel mucosa, which in the presence of folds and angles in the rectum and sigmoid may be readily overlooked. Indeed, it may be impossible to introduce the instrument up into the sigmoid because of adhesions impairing mobility, or because of the pain produced when one attempts to straighten out the bowel. Similarly a barium enema will usually contribute but little evidence to the diagnosis, as the tumour produces no obvious filling defect on the film.

Finally, even at exploratory laparotomy the appearances presented may definitely resemble those of a scirrhus carcinoma. From the beginning one has suspected a carcinoma. If, however, the pre-operative diagnosis has been a uterine or adnexal mass the discovery at laparotomy of a tumour in the bowel comes as a distinct surprise. From the peritoneal surface the lesion presents a puckering of the serosa and scarring almost identical with that produced by a scirrhus carcinoma. Until one thinks of endometrioma the features are those of an early scirrhus. However, there are three significant differences, which if known and looked for save the operator from the pitfalls of a wrong diagnosis. First, the stricture does not tend to encircle the bowel as in carcinoma. Endometrioma produces a puckering in the serosa rather than the appearance of a string tied around the gut which is so characteristic of malignancy. Secondly, the tumour can be lifted up as a button on the bowel wall and moved without moving the whole segment of the colon or rectum. Of course, one recognizes that all these features might be presented by a very early carcinoma beginning in the anterior wall of the bowel. Such an early carcinoma should, however, be seen on the mucosal side if it can be reached by the sigmoidoscope. Thirdly, though in an early carcinoma this is not significant, there are no enlarged lymph glands in the drainage areas. These three observations, coupled with the history of pain occurring only at, or aggravated by, the menstrual period,

* Personal communication.

should cause one to ask for the aid of a pathologist, if available, before embarking upon the radical procedure required for a malignant lesion.

These differential points apply only to small endometrial tumours limited to the bowel wall. Large pelvic endometrial masses have been encountered in which the uterus, tubes, ovaries, and bowel have all been involved. These are well described by Cullen and others.

TREATMENT

1. *Radiotherapy*.—Direct radiation with x-ray or radium to the tumour is practically valueless, because endometriomata are composed of well differentiated adult cells and are, therefore, definitely radio-resistant. It has been found that castration, either surgically or by deep x-ray therapy, will cause a recession of an endometrioma and complete relief of symptoms. The age factor, therefore, becomes the most important one in deciding the method of treatment.

X-ray treatment can be applied effectively and without risk, and for these reasons should be the method of choice in a woman near the end of, or past, the child-bearing age. In a young woman there are two reasons why surgical removal of the tumour should be regarded as preferable to radiation of the ovaries — conservation of the child-bearing function, and avoidance of the troublesome symptoms of an acute menopause.

2. *Surgery*.—Radical operations such as would be called for in the presence of a malignant tumour should have no part in the management of endometriosis, in view of its benign nature. Surgery should be conservative, namely, the local removal of the tumour only. There is no necessity for removing the bowel wall widely beyond the tumour or for excising gland-bearing areas, as the tumour is always localized. The question resolves itself into one of exact diagnosis, either before or during the operation.

Elliptical incision, with transverse suture of the bowel and omental graft, will be the usual procedure in the removal of these nodules. If the tumour is in the sigmoid or rectum a rubber tube extending from above the suture line and out through the anus would guard against tension due to gas. When dealing with tumours above the sigmoid a safety valve in the form of

a cæcostomy is desirable. Should the mass be large, or if causing obstruction, a preliminary colostomy would be required. I have not seen an endometrioma large enough to cause obstruction.

Conditions have been found at laparotomy where all the organs in the pelvis, including the rectum and sigmoid, were matted together with dense adherent tumour masses due to endometriosis. The adhesions in these cases are extremely dense and firm, much more so than in cases of pelvic inflammation or malignant disease. Attempts at surgical removal of such endometrial conditions have invariably been regretted. If I were to encounter such a case I should do a temporary colostomy, and rely on sterilizing doses of deep x-ray therapy, regardless of the age of the patient.

There are two basic facts regarding this disease which should be prominent in one's mind as the plan of attack is evolved in a given case, first that it is a benign lesion, and, secondly, that in the great majority of cases cessation of ovarian function is followed by atrophy of the tumour.

CONCLUSIONS

1. So far as my observation and reading goes, Sampson's implantation theory, with the tendency these implants have to become extra-peritonealized and extra-pleuralized (experimentally), can best explain all the locations in which these extra-uterine tumours have been found.

2. Endometriosis should be constantly kept in mind when a tumour in the bowel wall is encountered during a pelvic or abdominal operation, or when exploring for suspected carcinoma.

3. Although the condition mimics malignancy in many ways it can be differentiated and treatment of a benign lesion accordingly instituted. A temporary colostomy may in some cases be required, but a permanent colostomy, never.

REFERENCES

1. VON ROKITSKY, C.: Über Uterusdrüsenneubildung im Uterus, *Zeitschr. der K. und K. Gesell. der Aerzte zu Wien*, 1860. Ref. Curtis, *Obstetrics & Gynecology*, Saunders, Phila., 1933, 3: 339.
2. VON RECKLINGHAUSEN, F.: Die Adenomyome und cystadenomyome der Uterus und Tubenwandung, A. Hirschwald, Berlin, 1896.
3. FRANKL, O.: Adenomyosis uteri, *Am. J. Obst. & Gyn.*, 1925, 10: 681.
4. CHIVARI, H.: Zur pathologischen Anatomie des Eileiter Katarrhs, *Zeitschr. für Heilkunde*, 1887, 8: 457.

5. IWANOFF, N. S.: Adenofibromyoma cysticum sarcomatoides carcinomatosum, *Monatschr. f. Geburtsh. u. Gynäk.*, 1898, 7: 295.
6. SAMPSON, J. A.: Intestinal adenomas of endometrial type, *Arch. Surg.*, 1922, 5: 217.
7. BAILEY, K. V.: The etiology, classification and life history of tumours of the ovary and other female pelvic organs containing aberrant Müllerian elements, with suggestive nomenclature, *J. Obst. & Gyn. Brit. Emp.*, 1925, 31: 571.
8. BLAIR-BELL, W.: Endometrioma and endometriomyoma of ovary, *J. Obst. & Gyn. Brit. Emp.*, 1922, 29: 443.
9. Sampson, J. A.: Peritoneal endometriosis due to the menstrual dissemination of endometrial tissue into the peritoneal cavity, *Trans. Am. Gyn. Ass.*, 1927, 52: 171.
10. DUNCAN, C. J.: Endometrioma of Bartholin's gland, *New Engl. J. Med.*, 1934, 211: 24.
11. HARBITZ, H. F.: Clinical, pathogenetic and experimental investigations of endometriosis, etc., *Acta Chirurgica Scandinavica*, 1934, Supp. 30, 74: 327, and 45.
12. KOSSMAN, R.: Origin of the glandular inclusion in the adenomyomas of the uterus and tubes, *Arch. f. Gynäk.*, 1897, 54: 359.
13. JACOBSON, V. C.: Further studies in autotransplantation of endometrial tissue in the rabbit, *Am. J. Obst. & Gyn.*, 1923, 6: 257.
14. HENRIKSEN, E.: Primary endometriosis of the urinary bladder, *J. Am. M. Ass.*, 1935, 104: 1401.
15. KEENE, F. E. AND NORRIS, C. C.: Perforating ovarian cysts with invasion of the bladder wall, *Trans. Am. Gyn. Soc.*, 1925, 1: 218.

CHRONIC GLANDERS*

By J. F. BURGESS, M.D., F.R.C.P.(C.),

Montreal

HUMAN glanders is a rare disease. Robins¹ (1905), in a very excellent monograph on this subject, succeeded in collecting reports of 153 cases up to that time. Luhrs² (1921) believes that only 50 cases of glanders occurred in Germany during the war. Sobol³ (1933) states that in the Ukraine, where the frequency of glanders in horses is very high, it is a very rare disease in man. In the district about Constantinople it is said that 90 per cent of horses give a positive mallein reaction, yet human glanders is rare there.

Glanders is a specific, infective and contagious disease, occurring in most parts of the world, and caused by *B. mallei*. It affects, chiefly, the horse, mule and ass, and is communicable to man. It may be contracted by inhalation, ingestion, or by direct inoculation of the organism into the skin or mucous membrane. When it leads to a systemic disease, frequently associated with nasal ulcers, and involvement of the lungs, it is known as "glanders"; when the lesions are limited to the skin, it is known as "farcy". Both are manifestations of the same disease. Both types of the disease may co-exist in the same individual, and may be acute or chronic.

Since 1906, there have been some 48 reports of glanders in the literature, which I have been able to trace. A few notes on some of these may be given.

Hoffmann's⁴ case of chronic glanders developed the disease as a result of contact with a human case. The infection developed in the elbow, with purulent

exudation in the joint. The patient then developed ulcers of the gums, followed by involvement of the soft palate, the posterior pharyngeal wall and the fauces. Extension to the upper lip, with ulceration, occurred. Strauss' inoculation test was positive, and Hoffmann obtained, by means of a modified Wassermann reaction, a positive complement fixation with an antigen of *B. mallei*.

Dudgeon, Symonds and Wilkin⁵ reported the case of a man who developed an abscess in the lower end of the right humerus, followed during the next four months by many more abscesses over the body. There was no evidence of nasal discharge, nor was contact with horses established. *B. mallei* were demonstrated only after repeated passages through guinea pigs. There was a negative complement fixation reaction on the first occasion, but a strong reaction was obtained two months later, and a high titre agglutination. He stresses the value of complement fixation and agglutination reactions.

Fischer⁶ reports a case of nasal glanders successfully treated with auto-vaccine. The initial onset was influenzal, followed by ulcers (furunculoid in type) on the legs and nose, associated with deafness. In three years, the nose had been destroyed, and there was much scarring of the upper lip. Diagnosis was established on: (a) complement fixation test positive; (b) glanders bacilli found in the tissues; (c) positive guinea pig inoculation with Strauss' reaction; (d) ophthalmic mallein test positive. Twelve injections of auto-vaccine were given, with a gradual increase of the dose every three to four days. Fever reactions were present. The ophthalmic mallein test was negative after completion of treatment. Recurrence followed within two months, with unstated results.

Januschke⁷ reported the case of a man whose infection began with fever, bronchitis and infiltrations in the subcutaneous tissues of the leg. Foci developed in other areas. Guinea pig inoculations were positive for glanders. The agglutination test was positive in a dilution of 1-100, and the complement fixation test was negative during the formative stage, whereas later, during the healing stage, the agglutination test had an entirely normal value, and the complement fixation was positive. This fact has been noted in horses, namely, that the formation of agglutinin and amboceptor do not go hand in hand.

Watson⁸ reports a series of three cases, which occurred in an epidemic in Manitoba in 1922. Many horses were affected with the disease. His first case showed five or six discharging sinuses in the right leg. The *B. mallei* was isolated from the pus. Following injection of anti-mallein serum in one month all

* The Canadian Chairman's Address in the Section on Dermatology and Syphilology, combined meeting of the Canadian and American Medical Associations, Atlantic City, June 12, 1935.

discharge had ceased, and the sinuses had completely healed. The total duration of the disease had been one year. The complement fixation test was strongly positive. A recurrence developed in two months, with abscesses in the elbow and head. The doctor in attendance on the case developed an infection of the index finger, as a result of contact. *B. mallei* were identified. Serum treatment was instituted and cure resulted within two months. It is to be noted that where the disease had been diagnosed early and anti-mallein serum used the results were excellent.

Rateau⁹ states that glanders may be classically considered as follows: (a) Acute farcy with violent general symptoms resembling typhoid; (b) acute primary glanders beginning with a picture like acute articular rheumatism; (c) chronic farcy, sometimes isolated, sometimes associated with glanders; (d) chronic glanders following chronic farcy or chronic primary glanders.

Mendelson¹⁰ states that the disease may remain latent for long periods and he believed that it would be advisable to keep patients under observation for many years, stimulating their resistance by the use of vaccine and proper hygienic methods.

Balogh¹¹ emphasizes the difficulties found in post-mortem diagnosis of glanders, acute, subacute and chronic. He did autopsies on seven cadavers. Diagnosis was made before death in three of the cases. In the other four clinicians had diagnosed a variola vera, sepsis of unknown origin, a tuberculosis with chronic suppuration due to hyphomycetes, and a pulmonary phthisis, and later sepsis due to the tubercle bacillus.

Post-mortem diagnosis by section staining is possible in cases of chronic glanders (according to general experience) only because the patients usually die of new and fresh exacerbations of the disease. The acute changes in the lungs, in the early days of the disease, are likely to become modified and lead the clinician to make a diagnosis of pulmonary tuberculosis. In the fourth case, Balogh did not have his suspicions of glanders raised by the usual microscopic picture of odd lobulated, desquamative, necrotic, bronchial pneumonia, or by articular suppuration, but by the acute exacerbations of the original skin lesions. His assumption was fully confirmed by bacteriological findings. In chronic cases one can count on a progressive, severe necrotic inflammation of the trachea, the main bronchus and several branches.

Contact with horses is, as a rule, necessary for the occurrence of glanders in human beings. It is, therefore, commonly an occupational disease—a point of aid in diagnosis. Robins¹ listed the occupations in which it occurred as groom, soldier, coachman, horse trainer, pathologist, physician and butcher. Inquiry as to nasal discharge, submaxillary enlargements and abscesses in the necks of horses should be made. In man the virus may make an entry through an abrasion of the skin, frequently followed by lymphangitis and then nodules along the course of the lymphatic vessel or in other parts of the body. Glandular enlargements may, but only rarely, break down. The mucous membranes, particularly of the nose, but also of the mouth and genital tract, may frequently become involved. The conjunctiva of the eye has been the point of entry in some cases. In

some other cases the site of entry may not be found, and the disease may start as an acute infection, simulating respiratory disease, typhoid or rheumatic fevers.

Acute and chronic glanders vary in the intensity of the process. Acute glanders is practically always fatal; a small percentage of cases of chronic glanders occasionally ends in recovery, although the disease may be long drawn out, over years. Chronic glanders is characterized frequently by periods of acute exacerbations of the process. Where the disease makes its entry through the skin, the primary lesion is a vesiculo-pustule. Where the disease is acute, severe inflammation, with œdema and necrosis, occurs, associated with prostration, pyæmia and death. Generalized eruptions in the skin may occur, of the pustular and crusted types, along with abscess and ulcer formation, which may coincide with pyæmic phenomena. Where the disease tends to be chronic the signs of chronic inflammation are shown locally in marked infiltration, which goes on to abscess formation and ulcers, with, frequently, a tendency to fibrous tissue formation. Great destruction of tissue usually results, as the outcome of ulcerative lesions. Metastatic foci develop commonly in other parts of the body, particularly in the subcutaneous and intramuscular tissues. A common localization is in the muscles of the calf of the leg. Inflammatory processes in the nose tend to invade the fauces and throat, and much destruction results to both soft and bony tissues. Where the joints are involved the picture tends to be, at first, that of acute rheumatic fever, but the involved joints tend to become purulent. The lungs may be involved, primarily or secondarily, in a bronchiolitic process, or with numerous consolidations simulating tuberculosis, or as pneumonic areas. Foci may develop, where generalization supervenes, in the spleen and liver. Abscesses have been noted in the brain, causing signs of meningitis. The gastro-intestinal tract is rarely involved, but the organism has been found in a case of gastric ulceration. In a long standing case, amyloid disease of the viscera may occur.

Robins states that there is no essential difference between chronic and acute glanders, except in the severity of the process. It has been frequently attested to in the literature that the virulence of the organism is exceedingly

variable. Relative inactivity is common in chronic glanders, and the disease may remain localized, but it is frequently associated with periods of exacerbation and extension. This would seem to be a commonly characteristic phenomenon in glanders. It is further pointed out that periods of latency are not unusual, lasting over a period of some years. The disease simulates tuberculosis and syphilis in this regard. The incubation period in acute glanders is commonly 5 to 6 days, but in the chronic forms it may be many weeks.

B. mallei should be sought for in the discharges from open lesions. It may be demonstrated easily in acute glanders and in the acute clinical exacerbations of chronic glanders. In chronic glanders, where the disease is more or less stationary, it is exceedingly difficult to demonstrate the organism. Sometimes the *B. mallei* has been demonstrated in tissue sections, but this is difficult. Cultures should be made on glycerine agar and potato, and inoculation of pus should be made intra-peritoneally into male guinea pigs. The characteristic Strauss' reaction should be looked for. The organism may be so feeble that two or three passages through guinea pigs are necessary to raise its virulence. Certain other organisms, notably those of the brucella group, may also give the Strauss' reaction.

The mallein reaction is specific in horses, and its specificity has been carefully worked out. On the other hand, Topley and Wilson¹² state that in man the mallein test has been used in so few cases that it is difficult to gauge its value. Robins, in his monograph, reports a number of cases where the mallein test was negative in the presence of proved glanders. A few cases in the other literature are also reported as negative. This may possibly be due to the very low pathogenicity of certain strains of the organism, inasmuch as the virulence of the organism is exceedingly variable. A positive mallein reaction is not an urticarial, erythematous lesion, but a marked cellular and inflammatory response, characterized by a local erythematous swelling with œdema and infiltration lasting forty-eight hours, and associated with a systemic reaction and fever.

Topley and Wilson state that the complement fixation test is the most reliable laboratory test. According to Reinhardt (1919), there are faulty

positives in 4 per cent of healthy horses, and faulty negatives in 2 per cent of glandered horses. Watson⁸ found complement fixation specific in a high titre in three proved cases. He has observed the reaction in a small number of normal human sera. A further series of controls in both healthy human sera, and also in other human pathological sera, is being investigated. Topley and Wilson state, apparently referring to horses, that the best combination for proof of the disease is the complement fixation test and the conjunctival mallein reaction.

The agglutination test is also used, but its value is more doubtful. A precipitin reaction is thought not to be trustworthy enough for practical purposes.

CASE REPORT

A man, aged 59, who has always resided in North America, a butcher by trade, following discharge from the army in 1919 developed inflammatory lesions in the scrotum. These gradually enlarged, were painful, broke down, and discharged purulent material. Within a year the inner and upper parts of the thighs and buttocks became involved. There was no history of febrile disturbance. In 1923 an exacerbation occurred and lesions developed in the right axilla. In 1925 the left axilla became involved. It is characteristic of the process in this man that the discharge and associated pain varied greatly from time to time, but there had been no tendency for the lesions to recede. The man was admitted to hospital on June 1, 1934, for investigation, about fifteen years after the onset of the disease.

Condition on admission.—The patient was well nourished and healthy. His weight was well maintained. There was no adenopathy. There was a linear scar in the right axilla, where a focus was successfully removed surgically in 1925. In the groin, involving the scrotum, inner and posterior upper thirds of both thighs and perianal portion of the buttocks, there was a curious combination comprised of a semi-keloidal, semi-inflammatory process, through which numerous oblique and vertical sinuses were to be seen. Some of the orifices of these sinuses were dilated, and others were contracted by thickened scar tissue. The left axilla was similarly involved (see figures). The inflammatory processes in these areas were more marked at the periphery of the lesions, whereas scarring occurred in the central parts. No glands were to be seen and no bony involvement was present. Careful medical examination revealed no organic disturbance. The urinalysis was normal, and no anaemia was present. The white blood count, on different occasions, showed 15,000 white cells, with a relative increase of polymorphonuclear leucocytes. A sugar tolerance test showed a delayed assimilation. The cardiac, respiratory and abdominal organs revealed normal findings, and there was no organic nervous disease. Nose and throat examination was negative, and there was no history of nasal discharge.

Microscopic examination of pus and scrapings from the walls of the sinuses showed no fungus or yeast organisms. Thorough bacteriological investigation showed many staphylococci, along with a non-pathological diphtheroid, *B. mallei* was not grown. Numerous injections of pus and crushed-up curettings were made into the peritoneal cavities of guinea pigs. All were negative for *B. mallei* and any other pathogenic organism. Repeated passages were made in guinea pigs, without any gross or microscopic evidence of disease.



Fig. 1.—Extensive, chronic, inflammatory lesions, with sinus formation and scarring about the scrotum, thighs and buttocks.



Fig. 2.—Chronic granulomatous lesion, with keloidal scarring and sinus formation in the left axilla.

The blood Wassermann reaction was negative at this time. During his stay in hospital, a daily rise of one to two degrees of fever was present.

Two c.c. of mallein injected subcutaneously gave a violent local and general reaction, with fever which lasted 48 hours. This dose was excessively large. Later doses of 0.2, 0.1, and 0.5 c.c. were injected intra-dermally. Each test showed a marked local reaction, with an accompanying rise in temperature of 102 to 103° F., associated with a feeling of pain and tension in the lesions. At the site of each injection an area of erythema developed within 24 hours, with œdema and infiltration, associated with swelling of the arm. This acute phase lasted over 48 hours. The nodular, inflammatory zone at the site of injection lasted for one month. One of these lesions (0.1 c.c. mallein) was excised after 7 days. The histological report of this lesion was as follows:—

"The mid-part of the corium shows an area of necrosis, without definite borders, containing polymorphs, red blood cells and debris. In addition, there are focal areas in the lower corium about dilated and proliferated blood vessels, where there is also intense cellular reaction, consisting of epithelioid, polymorphonuclear and lymphocytic cells. There is intense œdema and exudation of more or less degree throughout the section, with secondary acanthosis and hyperkeratosis."

Auto-inoculation of pus from a sinus to an area on the chest was done. A focal reaction resulted, with erythema, infiltration and crusting, which disappeared in ten days.

Lymphogranuloma inguinale was excluded by means of the Frei test. This was completely negative on two occasions. Control tests on three cases of lymphogranuloma inguinale, using this antigen, were positive. A portion of tissue was removed from the margin of a lesion for histological report, which is as follows.

"In the central portion of the section there is a small ulcer where the epithelium is replaced by hæmorrhagic, necrotic, granulation tissue. The epidermis shows marked hypertrophy at the margins. Beneath the granulation tissue is an intense, inflammatory cell mass, made up of lymphocytes and plasma cells, with numerous polymorphonuclear cells towards the centre of the lesion. Some hæmorrhage is seen in the central area. Beneath and on either side of, this area the corium is

formed by fairly dense fibrous tissue, which extends into the subcutaneous tissue. There is a fairly marked vascular dilatation through the section."

Specimens of blood were sent to Dr. E. A. Watson, Chief Pathologist to the Animal Diseases Research Institute of Canada. A complement fixation test for glanders was strongly positive (4-plus). It is well known that previous mallein tests may give rise to antibodies in the bloodstream, and thus provoke a positive complement fixation and agglutination test. It has been shown by Brocq-Rousseau, Forgeot and Urbain that the antibodies disappear and the serum returns to normal in 45 days in horses. The test, therefore, was repeated at the end of three months, when it was again found to be strongly positive (4-plus). At this time, the patient was readmitted for further investigation. We were unable to demonstrate the presence of the *B. mallei*, in spite of repeated attempts during his second admission.

The Wassermann reaction had been reported as positive on certain occasions during the past 15 years. While in hospital, numerous Wassermann tests were done. There was a remarkable variation in the reports. The tests were usually reported negative, but on some occasions negative reactions became positive within intervals of two days. It was considered that these positive reactions were probably the result of non-specific antibodies present in the blood stream, and not due to syphilis, of which no other evidence was present.

This patient has had a good deal of treatment in the past 15 years. Anti-syphilitic treatment, consisting of arsphenamine injections, was given without any change in the condition. Pot. Iodide in large doses was given, with no obvious results. Ultra-violet and x-ray exposures were of no avail. Total excision of the area in the right axilla had eradicated the disease in that location, and numerous incisions for evacuation had been made in other areas, with only temporary relief. All local treatment of various forms had been used without success. In view of the excellent results obtained by Watson (*loc. cit.*) with anti-mallein serum, it was decided to institute this form of treatment. Over a period of two months the patient was given subcutaneous injections of this serum in doses of 2.5 c.c. to 10 c.c., every three or five days. At the end of a month considerable improvement had taken place in the inflam-

matory zone about the lesions in the axilla, with lessening of the discharge. In some areas the inflammatory process entirely disappeared, with resulting fibrosis. Shortly after, the treatment was discontinued, as the patient left Montreal. In January, 1935, after two months' treatment, when there was clinical improvement, a serological test gave a 2-plus complement fixation with glanders antigen. In April, 1935, following two months' cessation of anti-mallein serum, a complement fixation test showed reversion to 3-plus.

The curability of chronic glanders, according to Robins, has been greatly over-estimated. Gaiger,¹³ in a long personal experience over some years, believed that sunshine and fresh air were of primary value in the cure of this disease. Mallein has also been used in a therapeutic sense to stimulate antibody production, with value, apparently, in some cases.

COMMENT

The clinical picture suggests a chronic infection, as lymphogranuloma inguinale, granuloma inguinale, tuberculosis, syphilis, and other mycotic and yeast infections. All these, we believe, were excluded. The diagnosis of glanders was made. The clinical picture of a chronic, purulent infection associated with sinus formation, and with exacerbations at long intervals, would seem to support this diagnosis. The mallein reaction was strongly positive, and this was associated with markedly positive complement fixation. Investigation is continuing as to the specificity of the mallein reaction in man, and also the value of the complement fixation test. These have proved to be specific in horses,

but sufficient evidence has not yet accumulated as to the specificity in human individuals. It is of interest to note the serological evidence of improvement due to anti-mallein serum, of which there was some clinical evidence. The chronicity and marked fibrotic element evidently precluded success by this method. The case is reported to draw attention to the clinical and laboratory diagnostic difficulties of this rare disease.

I am indebted to Dr. E. A. Watson, Chief Pathologist to the Animal Diseases Research Institute of Canada, for serological tests and valued advice in the investigation and report.

REFERENCES

1. ROBINS, G. D.: Studies from the Royal Victoria Hospital, Montreal, 1905, No. 1, p. 11.
2. LUIRS: *Rotz. Centralbl. f. Bakt., Parasit., u. Infektionskrh.*, 1921, 85: 76.
3. SOBOL, I.: A case of chronic nasal glanders, *Acta Otolaryngol.*, 1933, 18: 500.
4. HOFFMANN, E.: Demonstration eines Falles von chronischen Rotz des Mundes und der Oberlippe, *Berl. klin. Wchnschr.*, 1908, 45: 1021.
5. DUDGEON, L. S., SYMONDS, S. L. AND WILKIN, A.: A case of glanders in the human subject, *J. Comp. Path. & Therap.*, 1918, 31: 43.
6. FISCHER, O.: Erfolgreiche Behandlung eines Falles von chronischen Nasenrotz mittels Autovakzine, *Deutsche med. Wchnschr.*, 1920, 46: 73.
7. JANUSCHKE, E.: Beitrag zur Kasuistik des chronischen Rotzes beim Menschen, *Berl. Tierarztl. Wchnschr.*, 1923, 39: 91.
8. WATSON, E. A.: On the serum therapy of glanders with special reference to glanders in man, *Am. Vet. Med. Ass.*, Montreal, August 27, 1923.
9. RATAU, J.: Contribution à l'étude de la morve chronique, *Rev. de Laryngol.*, 1928, 49: 230.
10. MENDELSON, R. W.: Glanders, *J. Am. M. Ass.*, 1929, 93: 1379.
11. BALOGH, E. VON: Die Diagnose des Malleus an der Leiche, *Wien. med. Wchnschr.*, 1934, 84: 376.
12. TOPLEY, W. W. C. AND WILSON, G. S.: Principles of Bacteriology and Immunity, Wm. Wood, New York, 1929, vol. 2.
13. GAIGER, S. H.: Glanders in man, *J. Comp. Path. & Therap.*, 1913, 26: 223.

A complete bibliography can be obtained on application to the author.

ADDISON'S DISEASE FOLLOWING ADRENAL DENERVATION IN A CASE OF DIABETES MELLITUS.—J. M. Rogoff cites a case in which an attempt had been made to benefit a diabetic patient by denervating the adrenals. Addison's disease developed. The history indicates that this syndrome was superimposed on pre-existing diabetes by surgical intervention with the adrenals. The surgical manipulations apparently resulted in occlusion of blood vessels and degeneration of the adrenal cortex. Of course the coexistence of diabetes may be assumed to have been unfavourable for possible regeneration of the damaged adrenal cortex. The patient was in a subacute condition of adrenal cortical insufficiency when seen May 12. At that time it appeared that he would survive probably not more than about six months. He died October 18. This prognosis was based on the existing evidence of advanced adrenal cortical insufficiency, indicating extensive and progressive degeneration of the glands. The development of ebony coloured small spots in a patient with Addison's disease is associated with irreparable damage to the cortex of the adrenals. The gravity of the con-

dition was indicated further by the repeated exacerbations and by evidence of progressive adrenal degeneration as interpreted from the costolumbar pressure reaction. The presence of this sign in Addison's disease may be interpreted as evidence of active inflammatory or degenerative processes in the gland. The case illustrates the serious danger of attempting adrenal surgery for the correction of various ailments supposedly related with disturbed adrenal function. Such supposed relations are entirely hypothetical and are not supported by tenable evidence. At any rate, the surgical procedures that have been employed should not be expected to be of permanent benefit, since denervation of the gland by section of its nerves is usually followed by regeneration of the nerve supply within a few weeks. Excision of one gland, as has sometimes been attempted, is subject to the same criticism, and is to be deprecated. The very fact that it is alleged to be of benefit in so great a variety of diseases ought to render the practice suspect.—*J. Am. M. Ass.*, 1936, 106: 279.

TIP OF THE NOSE COMPLETELY SECTIONED: SUTURED THREE HOURS AFTER THE ACCIDENT

By J. N. Roy, M.D., F.A.C.S.,

*Professor at the University of Montreal, Physician to the Notre-Dame Hospital,
Montreal*

IN the last thirty years experimental medicine has enabled surgery to make immense strides through the use of tissues removed from the organism and preserved under special conditions. These tissues, of various nature, can afterwards be grafted with success, even if their extirpation dates back to a relatively distant period. Inspiring myself with these facts, I had an experience a year ago which has been fortunate. The history is as follows.

CASE REPORT

On March 25, 1934, I was called to see a child of seven years of age who had lost the tip of the nose. His parents told me that the same evening, while playing, he broke the glass of an automobile light with his head, and in drawing back he entirely

On examination, I found a transverse loss of tissue at the region of the tip of the nose, of about 5 cm. in length by 13 mm. in its greatest breadth. This wound began at the right naso-labial fold and terminated at the left fold. At this last point the cartilage of the nostril was uncovered, which produced a slight notch. There existed moreover a lesion of the lip and of the cheek on the left side. The hæmorrhage was even yet abundant enough. I asked the father of the child if he had brought the tip of the nose, and, on his negative answer, I requested him to go at once to his home and seek it.

Operation.—In order not to lose any time, I had the patient chloroformed, and began without any delay the suture of the labial and cheek wound. Simultaneously an assistant made light compression upon the nose with a piece of ordinary gauze, in order to stop the hæmorrhage. Half an hour later, Mr. X. brought me the tip of the nose which was found upon a carpet in his house. It was white, and after having carefully washed it in tepid physiological serum, I placed it in the same solution, maintained at a temperature of



Fig. 1.—Aspect of the patient five days after the operation.



Fig. 2.—Aspect of the patient after the operation.



Fig. 3.—Patient cured, one year after the operation.

severed the tip of his nose. Later, having verified this detail, I observed that, indeed, the broken glass presented in its upper part a pyramidal form with an inferior base, and in withdrawing himself the boy had thrown his head backwards, a motion which had produced the injury. As the hæmorrhage was considerable, the patient immediately placed his hand to his nose, and came into the house. Compresses having been applied, he was afterwards taken to the hospital.

98.2° F., by means of the double boiler. At nine o'clock, the lip and the cheek were repaired. It was then exactly three hours since the tip of the nose had been sectioned from the nasal pyramid. The hæmorrhage being stopped, I made a last attempt to ensure asepsis of the wound, and the tip of the nose, well dried, was carefully coapted and sutured with silk by means of small conjunctival needles. As there was no loss of cutaneous substance, I succeeded in re-establishing the anatomical structure of this organ. A light compressive dressing was applied to the left nostril and to the exterior. In order to better stabilize the tip of the nose, and at the same time to increase its vitality, I placed a splint in copper, fashioned

* Wounded, presented cured, at the "Assemblée Scientifique du Bureau Médical de l'hôpital Notre-Dame", May 11, 1934.

for the occasion. The splint was retained by bands of adhesive tape, applied transversely to the nasal appendix. This means of protection has afforded me great service in the past, for many varieties of rhinoplasty.

Post-operative sequelæ were normal, and I did the dressing of the left nostril forty-eight hours after the operation. The dressings was then daily renewed. As to the one on the exterior, I waited till March 30th to change it. At this moment there existed a dry sanguineous layer over all the periphery of the sutured tip of the nose. This one presented at its centre a reddish colour which made me hope for its vitality. (See Fig. 1). In the process of time this layer gradually disappeared and I had the satisfaction of seeing that the tip of the nose had come to life again. I finished removing the sutures on April 4th. On the right side, the cure is perfect, as can be seen in Fig. 2, taken one year after the intervention.

However, the left side was less æsthetic. The cartilage of this nostril, having been exposed at the time of the accident, the nutrition of the cutaneous flap was poor; also, a loss of substance at the inferior part and a little depression in the naso-labial fold resulted. (See Fig. 3). As to the lip and cheek scars, very soft, they are hardly perceptible, and are of no particular interest.

This case report seems to me very instructive. It proves, indeed, that it is possible to replace a fragment of skin, separated from the organism for a few hours, and obtain an excellent result. Carrel,¹ of the Rockefeller Institute of New York, in remarkable experiments, has otherwise clarified the question of active or latent life perfectly to the point, in demonstrating that a tissue isolated from the place of its removal can preserve its vitality if it receives artificially a nutrition which is near the normal, or, yet, if it is kept in cold storage. According to this author, the blood plasma would be the nutritive liquid most appropriate to obtain survival during a period of time relatively long. However, he is of the opinion that cold storage offers less dangers of infection, and that it is more practical.

It is admitted that there exist in a human or animal being two kinds of death, that is to say, general death, produced by the definitive stoppage of the function of the heart, and secondary death of the elements which compose the different parts of the organism. This apparent tissue or cellular death becomes definitive and real when the cells have lost all their vital properties, following the prolonged stoppage of the nutritive and respiratory exchanges. It is then only that the microbes coming ordinarily from the bowels and the autolytic enzymes act on the tissues of the organism and cause their disintegration.

In my patient the problem was very simple. The accident occurred on March 25th, that is to say, at a period of the year when the temperature is yet low enough in Montreal, and the tip of the nose had remained in a room relatively cold before it was brought to me. The well-cleaned section had been produced by glass, and all the cutaneous tissue was complete.

As to asepsis I need not insist more, as it was incumbent on me to operate under the best conditions possible. However, I believe it is very important in these cases not to use strongly concentrated antiseptics, in order not to destroy the cellular vitality, and so prevent the healing of the replaced fragment of skin. I know of two failures which happened to colleagues of mine in the matter of two cutaneous grafts, probably due to the use of a mercurial solution. In the case of this severed tip of the nose I thought my duty to make it as aseptic as possible by the use of tepid physiological serum (as well as for the wound of the nose), and to keep it for one hour in this solution at the temperature of the body by means of the double boiler. As the tip had been separated from the body for three hours I can say that its vitality was latent during the first two hours, and that the precautions taken during the third one had perhaps prepared or favoured its return to active life.

Cure was perfect on the right side. On the left a small cutaneous fragment mortified, because it was in contact with the denuded cartilage of the nostril and, consequently, ill nourished. However, it will be easy later on to repair this notch and the naso-labial fold by my previously described method.²

I attach great importance to the light pressure which must be made on the whole of the graft in order to better re-establish its coaptation, and by the same fact to help its nutrition. Also the small apparatus in copper that I use frequently for my rhinoplasties, placed over the dressing, attains perfectly the double aim of stabilization and protection.

REFERENCES

1. CARREL, A.: The preservation of tissues and its application in surgery, *J. Am. M. Ass.*, 1912, 59: 523.
2. ROY, J. N.: Traumatic loss of substance of a nostril. Rhinoplasty with a dermo-epidermic graft, *Arch. Oto-Laryngology*, 1928, 7: 601.

THE ROLE OF ANATOMY IN THE RADIOLOGICAL STUDY OF THE SPINE*

By W. A. JONES, M.D., F.R.C.P.(C.),

*Queen's University,**Kingston, Ont.*

WHEREAS a knowledge of the anatomy of any bone or group of bones is a prime requisite in the interpretation of radiograms of such structures it is perhaps more than ever necessary in the effort to elucidate the numerous shadows cast on the film by the many bones composing the vertebral column. This osseous entity, made up as it is of such a large number of irregular, varied, and complexly-shaped bones, and subject to so many anomalous variations in development, offers a truly formidable problem in radiological interpretation.

One might discuss at length the variants of synostoses, diarthroses, fissures of the posterior neural arch and other developmental anomalies that confuse the tyro and bring forth mistaken diagnoses of disease and fracture. These conditions are however well covered in the literature by different authors, notably by Kohler, and time does not allow of the discussion of such. The general normal architecture of the vertebræ is to be found in any standard anatomical work and needs no further comment. Comparatively recent advances in the more detailed study of the human spinal column are, nevertheless, adding a new chapter to the radiological study of this important structure. Probably the most far-reaching of these advances is concerned with the latest concept of the intervertebral disc. This tissue not so many years ago was rather vaguely associated by most of us with the thought of a flat piece of gristle wedged in between the vertebral bodies for the more or less obvious purpose of acting as a buffer. It has now emerged as an organ in its own right, and has assumed in our minds a form and object peculiarly suited to certain definite functions, and subject to the modifications of a life cycle as are other organs of the body.

Much of the recent knowledge concerning the intervertebral discs is the outcome of the work of Schmorl,^{1, 2} of Dresden, and is the result of his indefatigable labours in the examination of thousands of spines. Credit must also be given to Beadle,³ who in 1931 published a very comprehensive survey of the work done in the Institute at Dresden. Beadle's excellent monograph is a model of contemporary medical literature, and his smooth easy style and well-chosen phrases present the subject in a most interesting and intriguing manner. The present address will deal with the bodies of the vertebræ and the intervertebral discs.

For the most part the bodies of all the vertebræ, except the atlas and axis, are quite similar. They vary in size and present certain other regional and functional characteristics.

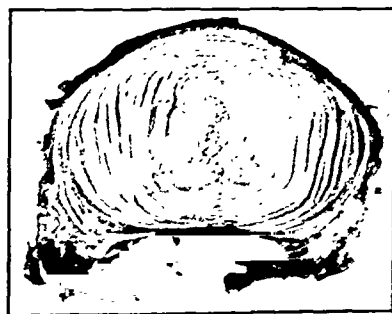


Fig. 1.—An intervertebral disc (Beadle) showing nucleus pulposus surrounded by the annulus lamellosus.

but their general make-up is the same. Each body is a short squat pillar composed of firm spongy bone interlaced with thin irregularly-placed trabeculæ, and surrounded by compact bone which forms a rigid protecting and supporting wall. At either end this pillar of bone is strengthened at its circumference by a strong rim of compact bone known as the epiphyseal ring. The ends of the body are relatively weak at the centre and are not strengthened by true compact bone. A sagittal section, however, shows that a degree of strength is given by the close apposition of two or three trabeculæ at

* Presented at the combined meeting of the American and Canadian Medical Associations, Atlantic City, Chairman's Address, Section of Radiology, June 12, 1935.

the superior and inferior surfaces of the body. In the few spines that I have had the opportunity of examining in sagittal section, it was noted that in almost every instance the greatest degree of reinforcement is at the lower surface, as one finds here usually an extra trabecular layer. This is perhaps significant, and is believed to be at least one reason why, with a compressed fracture of a vertebral body, it is usually the intervertebral space above the fractured body which is decreased in width. This point will be mentioned again in the appropriate paragraph. Covering the end-surfaces of the body is a thin layer of hyaline cartilage separating the bone from the intervertebral disc proper.

The picture of the body of the vertebra which one may visualize is that of a short drum-like pillar surrounded by a wall of compact bone, rimmed above and below by strong bony rings, and possessed of relatively weak ends, of which the upper surface is the weakest. Interposed between the vertebral bodies lie the intervertebral discs. The discs are composed of three parts, a central portion known as the

nucleus pulposus, surrounded by a ring of fibrous lamellæ styled the annulus lamellosus, and bounded above and below by plates of cartilage.

The articular cartilages are thin plates of hyaline cartilage separating the ends of the vertebral bodies from the nucleus pulposus of the disc. They cover only the central portion of the articular surfaces of the bodies and merge laterally into the fibres of the disc. The disc proper consists of the nucleus pulposus and the annulus lamellosus.

The nucleus pulposus may be described as a round semi-fluid mass which occupies the central portion of the disc. Microscopically, it consists of a network of fine fibrous strands laid down in a gelatinous matrix and enmeshing a profusion of variegated cells. The fibres of the nucleus are intimately connected with the cartilage plates and the nucleus itself merges into the encircling and supporting fibrous ring, the annulus lamellosus. In youth the nucleus is firm and elastic, and presents considerable pressure against its surroundings by reason of its own turgor. By turgor is

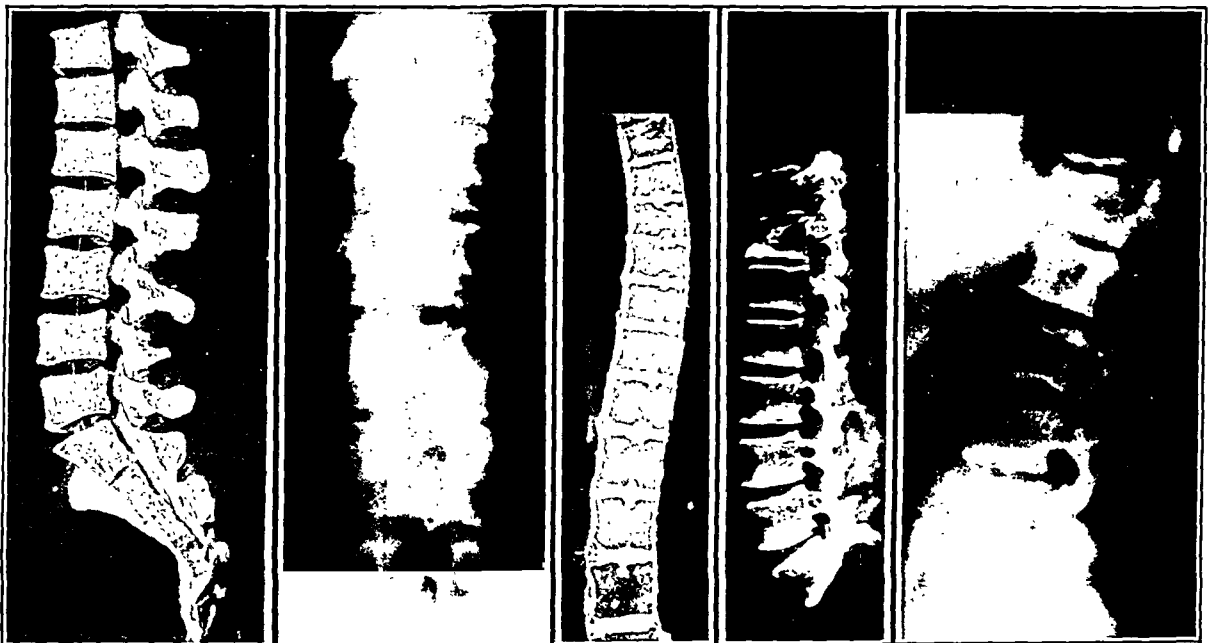


Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 2.—Mounted sagittal section of the lower half of a dried spine. The extra trabecular layer strengthening the inferior surface of each body is well seen. Fig. 3.—Narrowed intervertebral space between the bodies of the twelfth dorsal and first lumbar vertebrae. The first radiological sign of tuberculous spondylitis. Destruction of the body of the twelfth dorsal and abscess formation became evident on subsequent films. Fig. 4.—A youthful kyphotic spine (Beadle) showing double nuclear prolapses. Fig. 5.—Radiogram of museum specimen of lower portion of spine, in sagittal section. Old compressed fracture of body of eleventh dorsal vertebra. Note calcification of nuclear prolapse. Fig. 6.—Compressed fracture involving chiefly the upper and anterior portion of the body of the fourth lumbar vertebra. Note the narrowed intervertebral space above the fractured body.

meant the constant expansile force possessed by the nucleus. This turgor is a quality of youth, and gradually diminishes as the fluid content of the nucleus grows less with advancing age. The size of the nucleus and its turgor vary in different regions but are greatest in the cervical and lumbar portions of the spine where the quality of flexibility is most pronounced.

The annulus lamellosus is that part of the disc which gives form and size to the organ and which serves the function of attachment and transmission of tension throughout the spine. It is composed of coarse fibres which are arranged in a series of concentric lamellæ surrounding the nucleus. The strong firm fibres of the annulus are attached to the cartilaginous plate, the epiphyseal ring, and, very firmly, to the strong anterior longitudinal spinal ligament. Posteriorly the substance of the annulus is looser and the fibres blend in a fan-like arrangement with the comparatively weak posterior spinal ligament.

To recapitulate; the nucleus or central portion of the disc is a semi-fluid body possessing an elastic quality of turgor or a capacity for bulging outwards; the annulus or outer portion is a strong fibrous ring intimately connected with the vertebral bodies and the spinal ligaments, and built to withstand tensile stress. Together the nucleus and the annulus form the intervertebral disc proper. Each part works in unison with the other; the nucleus distributes pressure and acts as a cushion which receives, apportions and absorbs the shocks of daily life; the annulus moulds and protects the nucleus and withstands the tension and torsion of spinal movements.

The description of the intervertebral disc just given is that of the disc of the period of youth. As the life period advances the fluid content of the nucleus gradually decreases. In old age the nucleus finally loses its turgor, becoming dry and shrivelled; it may even crack transversely. The nucleus loses its entity as a distinct portion of the disc and the boundary between it and the annulus disappears. The course of the fibres of the annulus is lost and the whole disc becomes thinned. The degenerative changes in the disc, accompanied as they are by loss of function, place an uneven burden on the vertebral bodies, and the margins of the bodies respond by bone production and lipping

of the margins. Such changes in the bodies may also be caused by inflammatory lesions, but in persons over fifty these changes may usually be viewed as the natural result of age, and in the absence of clinical symptoms may be classified as normal. Other degenerative changes occur, such as the formation of calcium nodes in the discs, and, very rarely, calcification of the whole disc may take place. Hæmorrhage into the discs may also occur.

The plates of cartilage which separate the nucleus from the vertebral end-surfaces very often present linear breaks in continuity. These breaks occur in probably over half the cases examined. Under certain circumstances such as trauma, fracture, or osteoporosis of the vertebral body, these breaks may tear and widen on account of the turgor of the nucleus, allowing the nuclear tissue to rupture through the weak end-surfaces of the vertebral bodies into the spongiosa. In the early stages these prolapses cannot be seen by x-ray and may only be inferred by reason of the narrowing of the intervertebral spaces. Later, if the lesion becomes calcified, the prolapse shows as a definite calcified node just above or below the end-surfaces of the vertebral bodies. In other cases a radiological sequence is the formation of semicircular shadows immediately above and below the vertebral joint surfaces, the result of sclerosis of the envelopes of the nuclear prolapses.

In youthful kyphotic spines double nuclear prolapses occur typically. In the spines of senile osteoporosis either single or double prolapses are found.

Osteoporosis of the vertebral bodies in the presence of deficient cartilage plates leads to nuclear prolapse, but if the cartilage tissue remains intact the turgor of the nucleus pulposus expands the nuclear tissue, and, pressing downward and upward on the vertebral bodies, it becomes deeply biconvex and produces corresponding wide crescentic indentations of the end-surfaces of the bodies of the vertebræ. Radiograms show deepened intervertebral spaces and concavity of the upper and lower surfaces of the bodies. Films made in cases of senile kyphosis with coexistent osteoporosis and the nuclear tissue still retaining some of the turgor of youth show well the above findings. It should be noted that in cases such as have just been

mentioned, though the nucleus is intact, the kyphosis is determined by degenerative changes in the annulus, the anterior portion becoming thinned and allowing apposition of the anterior margins of the vertebral bodies.

Lesions involving thinning of the intervertebral disc due either to prolapse of the nucleus or to degenerative changes of the annulus are shown by Hadley⁵ to be of importance in that subluxation of the apophyseal articulations is allowed to take place, and he has shown in a series of excellent radiograms the new alignment of the anatomical relations of the vertebræ which takes place under these circumstances. He also draws attention to the fact that whereas damage to the disc is painless the secondary changes set up in and around the minor articulations do cause pain.

Strangely enough, Beadle points out that in Schmorl's collection of some 50 spines showing vertebral fractures, most of them being compression fractures of the bodies, injury to the disc is not an outstanding feature. This is curiously at variance with common radiological findings, where films showing definite narrowing of the intervertebral space are the rule in compressed fractures of the vertebral bodies. One cannot escape the conclusion upon observing the radiograms of these cases that much of the nuclear tissue must have ruptured into the spongiosa to account for the narrowed space which is presented. It is noted further that usually this narrowing occurs in the space above the fractured body. This fact is in agreement with the observations made earlier in this paper to the effect that as a rule the upper surface of the vertebral body is anatomically the weaker of the two ends of the bone. The logical inference is that the relative lack of strength of the upper surface of the bone determines the prolapse at this site.

A dissertation regarding prolapse of the nucleus and narrowing of the intervertebral space naturally turns one's thoughts to a radiological problem of absorbing interest. How often one sees in radiological literature the quite true statement that the first radiographic evidence of tuberculous spondylitis is usually narrowing of the intervertebral space. From the pathological viewpoint however this does not appear to be a correct statement of fact. The pathologist will admit that according to the films the

intervertebral space appears to be narrowed, but he insists, and rightly so, that the tuberculous disease starts in the bone and that involvement of cartilage is a late sequela. Unfortunately, in so far as well-merited curiosity is concerned, patients do not die of early tuberculosis of the spine and the problem is admittedly difficult of solution. How then may one reconcile the two different points of view? May one venture to propound a theory?

Let it be assumed that the primary tuberculous lesion of the spine begins in the vertebral body. For a time the disease progresses, weakening the upper or lower surface of the bone, but not yet producing destructive changes sufficient to be evident in the x-ray examination. The disc is as yet intact and radiographic examination is entirely negative. Suddenly one day the nucleus ruptures through the cartilage plate at the site of the weakened bone and radiographic examination subsequently reveals a narrowed intervertebral space. The first radiographic sign would naturally then be evidence of narrowing of the disc. Subsequent destructive bone changes would follow and be evident in ordinary sequence on the x-ray film. Such an interpretation appears to be logical and offers a rational explanation that reconciles the pathological and radiological findings in cases of early tuberculous spondylitis.

SUMMARY

The salient features of a study of the intervertebral discs are presented.

Attention is drawn to the structure, function and relations of the discs and the vertebral bodies:

1. An extra trabecular layer of bone reinforcing the lower surface of the vertebral body is noted.
2. The association of this with the usual narrowing of the intervertebral space above a compressed fracture of the vertebral body is described.
3. An explanation is offered that attempts to reconcile the pathologist's and the radiologist's conception of the earliest radiological sign in tuberculous spondylitis, *i.e.*, the narrowing of the intervertebral space.

The author gratefully acknowledges the cooperation of Prof. D. C. Matheson, Department of Anatomy, Queen's University, and Dr. C. D. T. Mundell, who prepared specimens of spines for investigation.

BIBLIOGRAPHY

1. SCHMORL, G.: The pathological anatomy of the intervertebral discs, *Klin. Wchnschr.*, 1932, 11: 1369.
2. SCHMORL, G. AND JUNGHAANS, H.: The intervertebral discs, *Die gesunde und kranke Wirbelsäule in Röntgenbild*, 1932, 40: 89.

3. BEADLE, O. A.: The Intervertebral Discs. Medical Research Council. Special Report Series No. 161, His Majesty's Stationery Office, London, 1931.
4. COMPERE, R. L. AND KEYES, D. C.: Roentgenological studies of the intervertebral disc, *Am. J. Roentgenol.*, 1933, 29: 774.
5. HADLEY, L. A.: Subluxation of the apophyseal articulations, with bony impingement as a cause of back pain, *Am. J. Roentgenol.*, 1935, 33: 209.

INGUINAL HERNIA: WITH SPECIAL REFERENCE TO SLIDING HERNIA AND A NEW TREATMENT*

By L. S. MACKID, M.D., F.A.C.S.,

Calgary

IN giving you my views in this short article on hernia, I will try to place before you as concisely as possible my own picture of a hernia in the inguinal region.

In the abdominal cavity we have a very large closed sac, which we call the peritoneum, and this sac covers either partially or completely most of the organs of the abdomen. It is reflected from one organ to the abdominal wall, then back to another organ, which it may completely invest, and comes down the opposite side to form a mesentery, and an organ swings freely. This gives the impression that some organs are inside the peritoneal sac, whereas they are extra-peritoneal but pushed into the sac. One of the organs, the testicle, which is developed from the Wolffian bodies in the neighbourhood of the kidney, starts to move down behind the peritoneum to its resting place outside the abdominal cavity, and in its descent pulls the peritoneum with it, down through the inguinal canal to the scrotum. This portion of the peritoneum which is pulled down with the testicle forms a funnel-like projection through the internal ring and a channel for the testicle. As this development goes on the lower end of the peritoneum goes to form the tunica vaginalis testis, and that part of the channel between the testicle and the abdominal cavity becomes obliterated, shutting off the testicle from the abdominal cavity. If this always happened in this way, we would have fewer hernias to deal with, but in many cases the channel between the testicle and the abdominal cavity is not obliterated, and we have

intestines falling into it, and this forms what we call "congenital hernia". This type we see from birth, and attempts are made in the young to cure it with trusses and outside supports. In some cases we get apparent cures. These apparent cures are due to a sealing together of two serous surfaces, but without obliteration, and so, later on in life, with the repeated strains put on it from abdominal pressure, we have these surfaces separating again, the old channel opened up, and the congenital hernia reformed. Now, in congenital hernia we always find the testicle inside the sac, and the blood vessels along the posterior wall, but outside of the sac and very difficult to separate from the sac. That, I think, will help to form a picture of the congenital hernia.

The acquired hernia is formed in a different way. The channel from the testicle to the abdominal cavity is completely blocked and obliterated, but we have a funnel-like projection into the abdominal ring, and the repeated abdominal pressures against this weak point do not force open the obliterated channel, but they do start a bulging in the side of the funnel, and this bulging keeps increasing in size till we have a well-formed sac, and this sac keeps forcing its way down the inguinal canal like a wedge, until it finally makes its appearance outside, and we recognize a hernia. Now in this type of hernia when we open the sac we find no testicle in it, and it separates fairly easily from the tissues of the cord. Why? Because it has made a channel of its own alongside the one the testicle made. Our line of treatment is to try to do what Nature did, that is, to obliterate the sac. This we cannot do, so we take the sac

* Read at the Annual Meeting of the Alberta Medical Association, Edmonton, September 18, 1935.

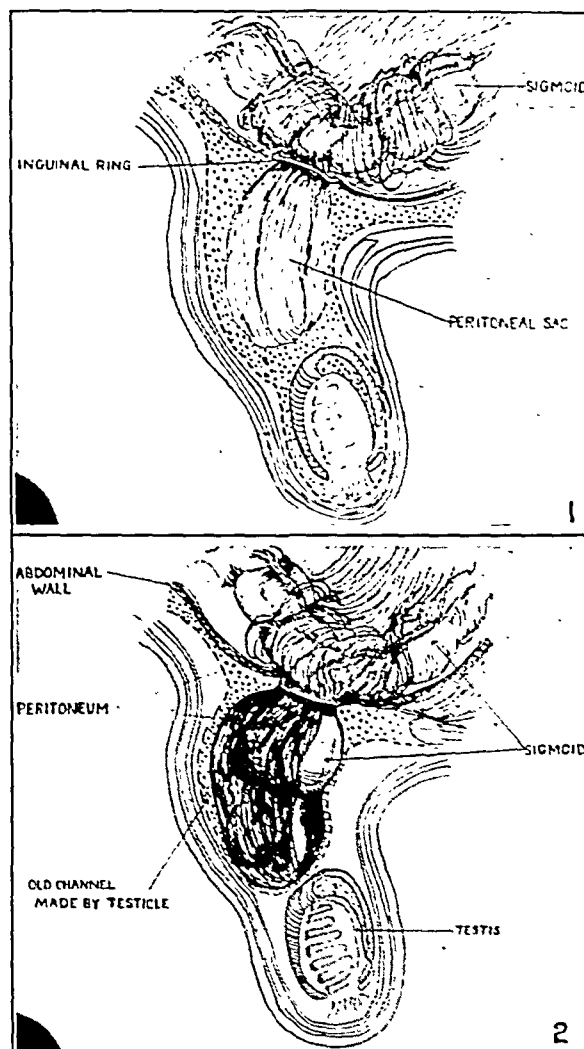
away, but we must try and go far up so as to destroy any funnel-like projection, and if we do this, then we get a cure. Leaving a projection is leaving an invitation for a recurrence.

The only cure for hernia is surgical. Trusses do not remove the sac; all they do is press two serous surfaces together and irritate them, so that they become thicker as a result of irritation, and as the most irritation is usually at one point we get more thickening there; the result is more or less a ring formation, which narrows the lumen of the channel and makes it more difficult for the intestines to fall into the bag. When they do get through this ring, they cannot always get back, and we get our emergency or strangulated hernia.

Now we come to another form of inguinal hernia, namely, the sliding hernia. This type of hernia occurs on the left side. I have never seen one on the right side, and do not see how one could occur there, except in cases of transposition of viscera, but there is a reason why they do not occur on the right side and always do on the left side. We have to go back to our developmental stage again. The foregut as far as the duodenum is a fixed position, and the hind gut from the splenic flexure to the rectum is a fixed position, but the mid-gut was extra-abdominal in the embryo and as development proceeded it was drawn into the abdominal cavity and underwent a process of torsion around the blood supply, from the superior mesenteric artery. The cæcum at first was under the stomach, but as development went on it went over to the right side and descended to its final position in the right iliac fossa, and, in so doing, it, in many cases, was pushed into the peritoneal sac, to such an extent that a mesentery was formed; especially so around the cæcum, as it is almost completely invested with peritoneum. Now this being the case about the cæcum, we have a right inguinal hernia, and on opening it we find cæcum in it with the appendix. We find it inside the hernial sac and can lift it out of the sac, replace it in the abdomen, and then deal with the sac itself, with no further cæcal interference.

A far different picture is seen on the left side, where the sigmoid comes into the picture. This sigmoid, being part of the hind-gut, was fixed from the beginning, and is only partially invested with peritoneum, so that it is not free

in the peritoneal sac like the cæcum, and when it moves as a mass it produces traction on the peritoneum, and it moves outside the peritoneal sac. When it becomes dislocated from its position and begins a descent it does just what the testicle did, *i.e.*, it pulls and pushes the peri-



Figs. 1 and 2

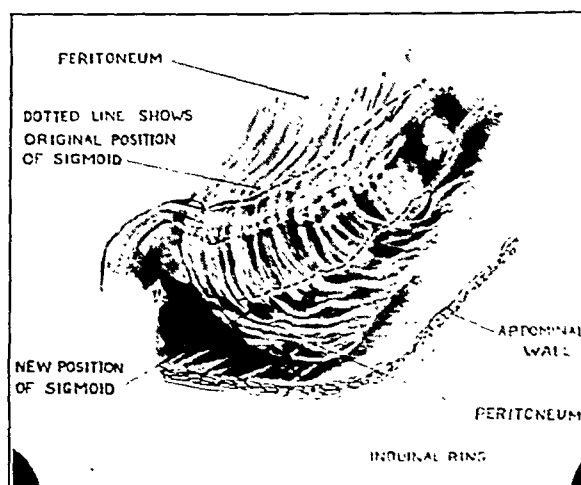


Fig. 3

toneum along with it, and so creates a bulging in the peritoneal sac. This bulging is from the pushing action, and consequently the bulging is in the peritoneum below the sigmoid. Now this sigmoid keeps coming down from its dislocated position, still pulling and pushing the peritoneum along with it, until it reaches the abdominal ring, and then it follows down the channel the testicle made. The sigmoid is now a part of the wedge that is opening up this channel, and the peritoneum it has pushed with it is a well-formed pouch into which loose loops of intestine or omentum fall, and help to force the mass down until it comes outside, and we recognize an inguinal hernia. To all intents it is the same as any inguinal hernia, producing the same symptoms, and cannot be differentiated until the sac is opened. When we open the sac we may find some loops of small intestine and the sigmoid. The small intestine we can replace in the abdomen, but the sigmoid we cannot. If the sigmoid had a mesentery here it would fall into the hernial sac. This would not be a "sliding" hernia then. The sigmoid is a part of the hernial sac. It is not inside the sac at all, it is outside, and the peritoneum we see over the sigmoid we cannot separate from it, so to get this back we push the sigmoid back, and try to hold it there by various methods of closure.

It occurred to me that there is only one way to make this closure lid, and that is, to replace the sigmoid in its proper position and close up the channel it made after becoming dislocated. To do this, you have to go into the abdomen so that you can see what you are doing. Go through the left rectus muscle at its outer margin and open the peritoneal cavity. You will readily find the internal ring and the sigmoid protrusion into it. Now as you had your sac opened at your first operation, just pull this down and get in behind it to the

channel of the sigmoid, and with gauze dissection, or even with the finger alone, dissect the sigmoid back along the channel it came until you have it near the position of fixation. Now you will have the redundant peritoneum or sac to deal with. This you split open, and you see your channel complete. Fasten the sigmoid down in position, and then, with the loose peritoneum, fasten the upper portion down over the old channel as far as the ring. Then take the lower flap of the peritoneum and overlap it well up on the opposite side of the sigmoid and to the peritoneal wall above. In this way you have the sigmoid fastened in its old place, but instead of a single layer of peritoneum over it you now have a double, and the same applies to the channel which the sigmoid had made. After the operation is over the sigmoid is not resting on the internal ring, as it does in other types of operation; it is almost two inches above the ring and it is fastened there. The channel is obliterated and you have a smooth peritoneal surface over the internal ring area. In my closure of the inguinal canal I do not displace the cord. The external oblique I open up, just above the external ring. Nature has made a better ring than I can make, so I do not disturb it. Then, in closing, I suture the external oblique above the incision line down to Poupart's ligament. Three good sutures are sufficient. I then bring the lower flap of external oblique and suture it well up as far as it will reach to the external oblique above. This gives me a double layer of aponeurosis along the inguinal canal. Open the patient's bowels in 48 hours, and keep him in bed for two weeks at least.

In devising this operation, I am applying the principle which Mr. Waugh, of London, applied to handling the ascending colon in his operation for mobile colon.

Drawings by Miss M. B. Forcade, Calgary.

THE HISTAMINE TREATMENT OF ALLERGIC CONDITIONS.—A. Dzsinich (*Klin. Woch.*, Nov. 8, 1935, p. 1612) reports good results in the treatment of fifteen asthmatic cases and three patients with chronic urticaria by desensitization with histamine. He believes that in sensitized patients the allergic reaction is produced by the setting free of histamine from the cells. Thus, in asthmatics it is set free from the cells of the bronchi; in urticaria from those of the skin; in hay fever from those of the nasal mucosa; and in migraine from those of the cerebral blood vessels. In desensitization the initial dose of

histamine was 0.00001 mg. in severe cases, and 0.0001 mg. in moderately severe cases. The dose was increased every second day, until by the twelfth injection it had reached 0.01 mg. In order to prevent untoward reactions the initial dose was given intracutaneously, after which subcutaneous injections were used. In most cases a cure was achieved after the twelfth injection, but in some patients eighteen to thirty were required. In only three cases were relapses noted after fifteen months.—*Abs. in Brit. M. J.*

EXPERIMENTAL ARSPHENAMINE DERMATITIS: I*

BY FRANK E. CORMIA, M.D.,

Montreal

THIS study is concerned with the nature of cutaneous sensitization to the arsphenamines, as produced experimentally in guinea pigs. The present paper will deal with certain base-line investigations; first, the determination of whether or not arsphenamine sensitization can be produced in this locality; secondly, inquires into the variations of different arsenical preparations, and different lots of the same preparation, to determine their sensitization index, and, thirdly, examination of the nature of the sensitivity when present. In a later communication other factors influencing the sensitization process will be considered.

Despite a voluminous group of clinical experimental reports very little is known of the nature of cutaneous arsphenamine sensitization. The recent paper by Shaffer¹ summarizes various theories concerning the development of the dermatitis as it occurs in man. Many intermediary mechanisms have been suggested, but no definite evidence has been brought forth which demonstrates that the sensitization is not a purely cutaneous phenomena affecting the complex bio-chemical processes in the individual cell. Most of the factors said to be predisposing causes of arsphenamine dermatitis, such as seborrhœic or ichthyotic states,² allergic tendencies,² infections,³ and vitamin inadequacies,⁴ probably act through their damaging or irritating effects on the cell proper.

Demonstration of cutaneous sensitization, once it has occurred, has been found to be difficult. Beerman⁵ stated that the routine patch test resulted in an increased incidence of arsphenamine dermatitis, and therefore was inadvisable for use in the determination of potential sensitivity. It furnishes, at times, confirmatory evidence of existing sensitiveness, but is no longer regarded as an infallible guide.⁶

The detection of sensitivity by means of the intradermal test has largely been discredited.^{7, 8} The sensitizing action of a single intradermal or

paravenous injection of arsphenamine in humans has been emphasized by many workers,^{9, 10, 11} and undoubtedly occurs. The variability of this response was recently noted by Schock.¹² He was unable to produce dermatitis in 101 patients in whom a preliminary sensitizing injection was followed after intervals of five to ten weeks with intravenous arsphenamine therapy. The criticism of Sulzberger¹³ that a confirmatory second intradermal injection was not given would seem to be invalid in view of the above observations,^{9, 10, 11} since if a real dermal sensitivity had been produced a dermatitis should have resulted from the later intravenous injections given after the end of the so-called sensitizing period. This type of response, however, is apparently not present in animals, as will be shown in the experiments to follow.

Moore and his co-workers,⁷ and Robinson,⁵ in the most massive American communications to date, have clearly summarized the inadequacies of the diagnostic patch and intradermal tests, and have suggested that intravenous testing may be the most reliable method of determining cutaneous sensitivity to arsphenamine.

In 1928 Frei¹⁴ reported that he was able to produce arsphenamine sensitization in both man and animals. Marked variations, however, were found in man, 12 per cent of non-syphilitic patients being sensitized¹⁵ while syphilitic patients were sensitized with difficulty.¹⁵ Mayer and Sulzberger¹⁷ duplicated the animal experiments in Germany, but were unable to confirm them in the United States.¹⁵ Sulzberger and Simon¹⁸ noticed marked variations in the production of sensitivity when the experiments were performed in New York or Boston. The controls were rigid, with the exception of diet variations. When sensitization occurred it was considered to be "directed toward the whole or part of the chemical complex of the organic trivalent arsenicals." Tauber²⁰ recently suggested that variations in the arsenical preparation might be a factor in the development of sensitization. His observations were based on

* From the Section on Dermatology, Department of Medicine, Royal Victoria Hospital, Montreal, Canada.

variations observed when the patch test was performed with different brands of arspenamine in known cases of arspenamine dermatitis. Sulzberger¹⁹ observed a series of cases of exfoliating dermatitis produced in quick succession by a certain factory lot of neoarsphenamine. Williamson and Morrell have confirmed these observations in guinea pigs. Their experiments suggested that guinea pigs could be more easily sensitized to some brands of neoarsphenamine than to others.

Lately, the influence of diet in the production of arspenamine sensitivity has been studied by Sulzberger and Oser,⁴ and by Chapman and Morrell.²¹ Chapman and Morrell found that guinea pigs on a diet high in vitamin C developed marked sensitization reactions to neoarsphenamine. A diet low in vitamin C, they stated, seemed to inhibit the development of sensitivity. Sulzberger and Oser,⁴ on the other hand, reported that guinea pigs given a diet high in vitamin C (0.2 mg. of ascorbic acid daily), developed a dermal sensitivity which was much less marked than that produced in pigs receiving less than 0.2 mg. of ascorbic acid. The pigs with the most marked sensitization reactions were often those with the most florid scurvy. The variation in these reports would seem to indicate that other factors apart from the effect of different diets may play a major rôle in arspenamine sensitization in guinea pigs.

MATERIALS AND METHODS OF THE PRESENT STUDY

Young adult guinea pigs weighing from 300 to 350 g. were used. The diet was kept a constant factor and was at all times high in vitamin C. Oats, milk, Purina Dog Chow* and fresh vegetables (raw carrots, beets, cabbage and lettuce) were supplied freely. The infection factor was carefully eliminated by segregating and discarding those animals that developed pneumonia or, rarely, colitis.

The technique of sensitization was that used by Frei and by Sulzberger.²² No. 27 gauge needles and a standard tuberculin syringe were used. The abdomen had been denuded of hair two days previously with a paste consisting of equal parts of starch and barium sulphide in water. Neoarsphenamine, 0.15 g., was dissolved in 10 c.c. of distilled water, and 90 c.c. of normal saline was added. The solution was then injected intradermally in the abdomen of the guinea pig in a dose of 0.1 c.c. (0.00015 g. of neoarsphenamine).

In a number of the pigs subsequently shown to be sensitized to the injected solution a flare-up of the injection site occurred from six to fourteen days after the injection. This flare-up was erythematous in nature,

and varied in size from that of a dime to that of a nickel. It was invariably followed by the gradual development of a hard red papule, the size of a split pea. This in turn disappeared after a period of one to two weeks. Twenty-eight days after the first injection a similar injection was given at a new site. If sensitization had developed a larger erythematous flare, and often œdema, appeared at the injection site within twenty-four hours. It disappeared within ninety-six hours in all instances.

Reactions were tabulated as \pm , questionable erythema; 1-plus erythema, 1 centimetre in diameter; 2-plus erythema, 2 cm. in diameter; 3-plus, quarter-sized erythema with small central œdema; and 4-plus, silver-dollar-sized (or larger) erythema with large area of central œdema.

Experiment 1.—(a) Five pigs were injected intradermally with 0.1 c.c. of lot A of brand 1 neoarsphenamine. One pig developed a sensitization reaction (split-pea-sized flare) after six days, followed by a characteristic hard papule. The other four pigs showed no reaction. Twenty-eight days later the five pigs were similarly injected at a new site. In the previously reacting pig a second sensitization flare, bean-sized, developed after twelve hours, and disappeared after another forty-eight hours. None of the remaining pigs reacted to the second injection.

(b) Five normal pigs were injected as in (a) using this time lot B of brand 1 neoarsphenamine. Two pigs developed sensitization reactions at seven and eight days respectively. Four of the five pigs developed reactions to the second injection. There were two 1-plus reactions, one 2-plus reaction, and one 3-plus (flare with central œdema) reaction.

(c) Five normal pigs were given an initial injection with 0.1 c.c. of lot A of brand 1 neoarsphenamine. One of the five developed a 2-plus sensitization flare on the ninth day. After the customary twenty-eight day interval, all five were reinjected, this time with lot B of brand 1 neoarsphenamine. The previously reacting pig developed a 2-plus reaction within twenty-four hours, a second pig showed no reaction, while a third pig developed a 1-plus flare on the third day, followed by a pea-sized papule of four days' duration. The remaining two pigs showed no immediate reaction, but developed a 1-plus flare on the sixth day. These flares rapidly became papular, and persisted for eight and twelve days, respectively.

Interestingly enough, both lots A and B of brand 1 neoarsphenamine had previously been used in the treatment of syphilis at the Dermatological Clinic of the Royal Victoria Hospital. No clinical experiments were done with either lot, but one paravenous injection was inadvertently given with lot B. Unfortunately the remainder of the injection was not given at the time in another vein. Four weeks later an early papular eruption appeared on the pre-sternal region and the flexures of the arms. There was mild œdema of the eyelids. Arspenamine therapy was discontinued. A patch test done with a 30 per cent solution of lot B was strongly positive. After a six weeks' interval of bismuth and desensitization measures the patient was cautiously given bismuth arspenamine sulphonate. To date he has taken twelve injections without reaction. It would seem that he developed only mild arspenamine sensitivity.

From experiment 1 the following conclusions are drawn:—

1. There was a definite difference between the sensitization index of lots A and B of brand 1 neoarsphenamine. Lot A was slightly, lot B, moderately, sensitizing (no marked reactions) in their effects.

* The composition of "Purina Dog Chow" was a balanced diet in itself, with an adequate amount of vitamins A, B and D. It was low in vitamin C, which was supplied by the milk and fresh vegetables.

2. The sensitizing power of lot B seemed to coincide roughly with the degree of sensitization developed in the patient described.

3. When lot A and lot B were both used in the sensitizing injections the effects seemed to be intermediate. This may correspond with what is occasionally seen clinically in man.

Experiment 2.—Six normal pigs were injected as in (a), this time using lot A of brand 2 neoarsphenamine. From six to fourteen days later 5 of the six developed 2-plus erythematous flares at the previous injection site. Unfortunately, 2 of the pigs later died of an intercurrent pneumonia. The 4 remaining pigs, when reinjected at the end of the twenty-eight day interval, all reacted locally. There were two 2-plus reactions and two 4-plus reactions.

This preliminary experiment with brand 2 neoarsphenamine suggested that here was an arsphenamine with a high sensitization index. Accordingly, 10 more normal pigs were given a preliminary intradermal injection with lot A of brand 2 neoarsphenamine. A 2-plus flare occurred at the injection site from six to eleven days later in all ten pigs.

Twenty-eight days after the initial injection a second series of injections was given intradermally in the ten pigs. These consisted of two intradermal injections, given simultaneously to each pig on opposite sides of the abdomen. The first contained the usual amount of lot A of brand 2 neoarsphenamine, the second a corresponding amount of lot B of brand 1 neoarsphenamine.

TABLE I
TABULATION OF REACTIONS

	±	1-plus	2-plus	3-plus	4-plus
Lot A of brand 2 neoarsphenamine	0	0	2	4	4
Lot B of brand 1 neoarsphenamine	3	3	2	2	0

From experiment 2 the following conclusions are drawn:—

1. Lot A of brand 2 neoarsphenamine had a high sensitizing index.

2. The injection of lot B of brand 1 neoarsphenamine (an arsenical of somewhat lower sensitizing index) resulted in local intradermal reactions in pigs sensitized to lot A of brand 2 neoarsphenamine. These reactions, however, were less marked, and suggested that a higher degree of cutaneous hypersensitivity was developed when a single lot of a preparation of a high sensitizing index was used throughout the sensitizing period. The question as to whether this group of ten pigs were really sensitized to lot B of brand 1 neoarsphenamine will be considered in experiment 5.

Experiment 3.—An experiment was conducted to determine whether or not the patch test was of value in the detection of sensitization, as previously demonstrated by intradermal testing.

Lot A of brand 2 neoarsphenamine was applied on the skin of the abdomens and flanks of two normal pigs

for twenty-four hours. Five individual patch tests were applied to each pig, the concentrations being 2, 5, 10, 20 and 30 per cent. The patch tests done with the 2 per cent solutions were negative. The pigs reacted to the 5 per cent concentrations with erythema, and to the 10, 20 and 30 per cent solutions with erythema, hæmorrhage and necrosis.

Patch tests with 2 per cent solutions of neoarsphenamine were applied percutaneously in eight previously sensitized pigs, four of which had been sensitized intradermally with lot A of brand 2, and four with lot B of brand 1. Two patch tests were applied to each pig, both lot A of brand 2, and lot B of brand 1, being used. There were no cutaneous reactions to any of the patch tests.

From experiment 3 the conclusion is drawn that the patch test is of no value in the detection of cutaneous hypersensitivity to individual brands of neoarsphenamine in guinea pigs. This result is at variance with that reported by Tauber²⁰ in human beings.

Experiment 4.—Eight pigs were sensitized intradermally to neoarsphenamine, (a) 4 to lot B of brand 1, and (b) 4 to lot A of brand 2. Each pig was then injected intradermally with 0.1 c.c. of three solutions, the first containing 0.12 mg. of tryparsamide, the second 0.04 of potassium arsenite, and the third 0.15 of the alternate brand of neoarsphenamine.

TABLE II

	Tryparsamide Dosage 0.12 mg.	Potassium Arsenite Dosage 0.04 mg.	Lot A brand 2 neoarsphenamine Dosage 0.15 mg.
Group A	1 ± reaction	no reactions	3 3-plus reactions
Group B	no reactions	1 ± reaction	2 3-plus reactions

As will be seen in Table II, there were no definite reactions to either tryparsamide or potassium arsenite injected in a dosage comparable to that of neoarsphenamine (0.03 mg. of arsenic). The figures for potassium arsenite vary markedly with the results obtained in a similar experiment by Sulzberger and Simon.¹⁹ They found that potassium arsenite was locally irritating in the above and in one-tenth of the above dosage, both in sensitized and control animals. It would seem that the present group of pigs either had comparatively insensitive skins or that the preparation itself is a varying factor.

The figures for neoarsphenamine merely confirm the results of experiment 2, and again suggest that the sensitizing index (or local reactivity) of lot A of brand 2 neoarsphenamine is greater than that of lot B of brand 1.

From experiment 4 the conclusion is drawn that cutaneous sensitivity as developed and determined by the intradermal method is apparently specific for the trivalent group of arsenicals.

Experiment 5.—It was decided to apply to animals the intravenous test recently advocated for human beings by Moore and his colleagues,⁷ as confirmatory evidence of arsphenamine sensitivity. The technique used for the intravenous injections was that recommended by Kolmer.²³

In a series of 5 normal pigs a preliminary experiment was performed to determine the toxicity and minimal lethal dose of lot A of brand 2 neoarsphenamine.

The five pigs were given the following dosage intravenously in the posterior superficial thigh vein, 0.05; 0.075; 0.1; 0.25; and 0.3 grams (calculated in grams per kilo of body weight). Despite the adequate dilution and slow injection recommended by Kolmer, all pigs developed reactions suggesting colloido-elastie shock, if as much as 0.1 g. per kilo of body weight was given. This consisted of minor convulsions lasting from one to two minutes, after which time the pig was weak and semi-stuporous for a period of five to fifteen minutes. At the end of this period, four of the five pigs became seemingly normal in all respects. No visceral lesions were found at autopsy when the pigs were killed ten days later. The pig receiving 0.3 g. per kilo of body weight died eight hours after the injection. The autopsy was negative, with the exception of a moderate degree of early parenchymatous degeneration of the liver.

Nine guinea pigs were chosen for the following experiment. Six of these pigs had been previously sensitized with lot A of brand 2 neoarsphenamine, the other three with lot B of brand 1 neoarsphenamine. Lot A of brand 2 neoarsphenamine was used in all of the intravenous injections.

The 6 pigs sensitized with lot A of brand 2 neoarsphenamine had been given, simultaneously with the second sensitizing intradermal injection, a similar injection of lot B of brand 1 on the opposite side of the abdomen. To 3 of these six pigs 0.1 g. of neoarsphenamine per kilo of body weight was given intravenously to the other three pigs, 0.2 g. per kilo of body weight. The results were interesting. Within twenty-four hours, 5 of the six pigs developed localized reactions on the abdomen. In no instance did a generalized dermatitis occur. The reactions in each instance occurred at the identical area of the second intradermal reaction. No reactions occurred at the second intradermal injection flare to the neoarsphenamine (lot B of brand 1) with which the guinea pig had not been originally injected. In other words, it seemed an essential pre-requisite that to truly sensitize a guinea pig both the first and second intradermal injections should be made with a single brand of neoarsphenamine. The reactions to the intravenous injections did not correspond uniformly to the amount injected. For example, two pigs given 0.2 g. of neoarsphenamine per kilo of body weight had only 2-plus flares.

The injection of the last 3 of the nine pigs brought out an interesting point. To each of these 3 pigs 0.1 c.c. of lot A of brand 2 neoarsphenamine was given intravenously. These pigs had previously been sensitized intradermally with lot B of brand 1 neoarsphenamine. The first pig failed to develop a cutaneous reaction, the second showed \pm flare, while the third had a 4-plus flare and oedema. In these three pigs the percentage of cutaneous reactions following the intravenous injection was much lower than in the first group, suggesting that for the development of maximum reactions to the intravenous injection, the two intradermal injections and the intravenous injection should be made with the single lot and brand of arsphenamine. On the other hand, the occasional occurrence of reactions to the intravenous injection is stressed, even when the arsphenamine used was not that employed in the earlier intradermal injections.

In the second group of three pigs the variability of the intravenous and the second intradermal reaction was seen. The pig developing the 4-plus intradermal reaction to the intravenous injection had previously shown a \pm reaction to the second intradermal injection, while the negative reaction occurred in one which had previously developed a 2-plus reaction to the second intradermal injection.



Fig. 1.—Cutaneous reactions to intravenously injected neoarsphenamine.

In this figure the intensity of the reactions is shown. The sites were huge, bright red in colour, and markedly oedematous. Pig No. 1 was one of the second group of three pigs, while pig No. 2 was one of the pigs in which the same lot of neoarsphenamine was used throughout.

From experiment 5 the following conclusions are drawn.

1. Intravenous testing may confirm or disprove the evidence suggested by the results of intradermal testing. It may be a more accurate method of determining cutaneous sensitivity to the arsphenamines.

2. Cutaneous arsphenamine hypersensitivity, as developed in guinea pigs, varies in its nature from that seen in man. It is a localized rather than a generalized sensitivity. The initial intradermal injection apparently sensitizes all of the dermal cells to the further action of arsphenamine. The second intradermal injection, strangely enough, seems to act in completing the

sensitization cycle only at the site of the injection.

3. The sensitization cycle seems to be completed more readily when a single lot of arsphenamine is used throughout.

Experiment 6.—Six guinea pigs were given a single intradermal injection of lot A of brand 2 neoarsphenamine. After a thirty-day interval each was injected intravenously with 0.1 g. per kilo of body weight of the same arsphenamine. No cutaneous reactions occurred. From this experiment the conclusion is drawn that the second sensitizing intradermal injection is necessary for the development of cutaneous sensitivity in guinea pigs.

SUMMARY

1. Two lots of one brand and one of another brand of neoarsphenamine varied greatly in their power to cause cutaneous sensitization of normal guinea pigs fed on a diet high in vitamin C.

2. The sensitizing power of one of these arsphenamines seemed to coincide roughly with that developed in a patient who had been inadvertently given a paravenous injection of the same lot of arsphenamine.

3. A higher degree of cutaneous hypersensitivity was developed when a single lot of an arsphenamine of a high sensitizing index was used throughout the sensitizing period.

4. The patch test was of no value in the detection of cutaneous hypersensitivity to neoarsphenamine in guinea pigs.

5. Cutaneous sensitivity to the arsenicals, as developed and determined by the intradermal method, is apparently confined to the trivalent group.

6. Intravenous testing may be a more accurate method of determining cutaneous sensitivity to the arsphenamines.

7. Cutaneous arsphenamine hypersensitivity in guinea pigs differs in its nature from that seen in man. The second intradermal injection, apparently not essential for the development of arsphenamine dermatitis in man, is a necessary pre-requisite for the development of cutaneous sensitivity in guinea pigs.

8. The localized nature of the reactivity in guinea pigs suggests that a disturbance in the local cellular equilibrium had been caused by the direct action of the arsphenamine solution.

That this may be due in part to local tissue injury is inferred from the fact that vascularily conferred arsphenamine gives rise to a cutaneous flare only when the initial injury has been followed by local cutaneous assault.

Since this article was sent for publication, that brand of neoarsphenamine with the high sensitization index was submitted to a reliable laboratory for analysis. It was found that the neoarsphenamine was well tolerated by white rats, the usual toxicity tests being within normal limits. This suggests that the skin sensitizing index of neoarsphenamine cannot be determined by any known chemical or animal toxicity tests. This lack of relationship between the toxicity and tendency to cause dermatitis is well exemplified by the preparation sulpharsphenamine. This product is less toxic than neoarsphenamine by laboratory tests (Raiziss), and yet it causes decidedly more dermatitis in patients than arsphenamine.

REFERENCES

1. SHAFER, L.: Treatment of postarsphenamine dermatitis, *Arch. Dermat. & Syph.*, 1934, 29: 173.
2. STOKES, J. H.: Modern Clinical Syphilology, 2nd ed., Saunders, Phila., 1934, 484.
3. (a) STOKES, J. H. AND CATHCART, E.: Contributing factors in post-arsphenamine dermatitis, *Arch. Dermat. & Syph.*, 1923, 7: 14.
(b) STOKES, J. H. AND KULCHAR, G.: Infection allergic complex in arsphenamine dermatitis reactions, *Brit. J. Dermatol.*, 1934, 46: 134.
4. SULZBERGER, M. AND OSER, B.: The influence of ascorbic acid of diet on sensitization of guinea pigs to neoarsphenamine, *Proc. Soc. Exper. Biol. & Med.*, 1935, 32: 716.
5. BEERMAN, H.: Cutaneous sensitization to arsenic through the patch test, *Arch. Dermat. & Syph.*, 1933, 28: 296.
6. ROBINSON, H.: Patch tests in determination of arsphenamine sensitization, *Southern Med. J.*, 1934, 27: 845.
7. MOORE, J. E., WOO, S., ROBINSON, H. AND GAY, S.: Reactions of the skin following the intradermal injection of arsphenamine: post-arsphenamine dermatitis, *Arch. Dermat. & Syph.*, 1931, 23: 74.
8. CANNON, A. AND KARELITZ, M.: Intradermal tests in relation to arsphenamine dermatitis: A study of 256 clinical cases, *Arch. Dermat. & Syph.*, 1934, 29: 485.
9. KLAUDER, J.: personal communication.
10. NATHAN, E. AND GRUNDMANN, H.: Chemische Analyse der Hautüberempfindlichkeit nach experimenteller Sensibilisierung mit Salvarsan, *Dermat. Zeitschr.*, 1930, 59: 367.
11. STOKES, J. H.: Modern Clinical Syphilology, 2nd ed., Saunders, Phila., 1934, p. 313.
12. SCHOCK, A.: Arsphenamine dermatitis: attempted sensitization to neoarsphenamine and further observations on the patch test, *Arch. Dermat. & Syph.*, 1934, 30: 672.
13. SULZBERGER, M.: Comment on paper by Schock; *ibid.*, 1934, 30: 689.
14. FREI, W.: Ueber willkürliche Sensibilisierung gegen chemischdefinierte Substanzen, 1, *Klin. Wchnschr.*, 1928, 7: 539.
15. FREI, W.: *ibid.*, 1928, 7: 1026.
16. FREI, W. AND BILBERSTEIN, H.: Quoted by Sulzberger in comment on paper by Schock (Ref. 12).
17. MAYER, R. L. AND SULZBERGER, M.: Zur Frage der jahreszeitlichen Schwankungen der Krankheiten. Der Einfluss der Kost auf experimentelle Sensibilisierungen, *Arch. f. Dermat. u. Syph.*, 1931, 163: 245.
18. SULZBERGER, M. AND MAYER, R.: Sensitizations: regional, seasonal, dietary, and other influences accounting for variations and fluctuations, *Arch. Dermat. & Syph.*, 1931, 24: 537.
19. SULZBERGER, M. AND SIMON, F.: Arsphenamine hypersensitivity in guinea pigs III, *J. Allergy*, 1934, 6: 38.
20. TAUBER, E.: Comment on paper by Schock, *Arch. Dermat. & Syph.*, 1934, 30: 689.
21. CHAPMAN, C. AND MORRELL, C.: Influence of vitamin C on development of skin sensitivity to neoarsphenamine in the guinea pig, *Proc. Soc. Exper. Biol. & Med.*, 1935, 32: 813.
22. SULZBERGER, M.: Hypersensitivity to arsphenamine in guinea pigs I, *Arch. Dermat. & Syph.*, 1929, 20: 669.
23. KOLMER, J.: Chemotherapy with special reference to treatment of syphilis, Saunders, Phila., 1926, p. 44.

THE SO-CALLED MOSAIC FUNGUS AS AN INTERCELLULAR DEPOSIT
OF CHOLESTEROL CRYSTALS*

BY A. M. DAVIDSON, M.B., CH.B. (EDIN.), M.D. (MAN.), M.R.C.P. (EDIN.), F.R.C.P. (C.),

Lecturer in Dermatology, University of Manitoba,

AND P. H. GREGORY, B.Sc., PH.D. (LOND.),

*Research Worker on Dermatophytes, University of Manitoba,**Winnipeg*

WHEN scrapings from the feet, mounted by the usual method in potash, are examined microscopically for the presence of ringworm fungi, two kinds of fungus-like structures are commonly observed. One kind consists of long, more or less sinuous, sparingly branched threads, which are universally recognized as true hyphae belonging to a dermatophyte (Fig. 1). Attempted isolations from such material yield a high proportion of cultures. The other kind consists of irregular discrete branching threads which follow the contours of the epithelial cells (Fig. 2). It has been named "mosaic fungus" by Weidman, and is still the subject of controversy, as its supposed status as a fungus has not hitherto been clearly proved or refuted. Isolations of dermatophytes have seldom been reported from material which contained only the "mosaic fungus".

Weidman,¹ who in 1927 drew attention to these bodies by his original description, suggested that if fungi they must be in a degenerate state. Other workers have regarded them as pathogenic fungi which have been incompletely destroyed by the immunity reactions of the body. Others again have regarded them as consisting of air or potash between the cells, or as collections of intercellular organic debris.

At Winnipeg during the past four years, in the course of routine laboratory examinations, the "mosaic fungus" has frequently been observed. On October 18, 1934, specimens were prepared by placing scales on a slide in a drop of 20 per cent potash under a cover-glass and leaving for an hour or more without heating.

The cover-glass was then pressed gently, to flatten out the macerated scale. The mosaic was located with the low power of the microscope, and then examined with the oil-immersion objective and the 10x ocular of a Leitz binocular microscope, giving a magnification of about 930 diameters. The elements of the mosaic were immediately seen to consist of piled masses of the flat rhombic crystals of cholesterol. Some of the crystals showed the re-entrant angle often seen in crystals of this substance.

Since our original discovery that the mosaic can be resolved into an aggregation of cholesterol crystals, scales from a number of other patients have been examined and the crystalline nature of the "mosaic fungus" has been amply confirmed. After the scale has been pressed out under the cover-glass most of the crystals are seen in surface view, but in unflattened preparations a number are seen edgewise and the crystalline nature of the elements is then obscured. The crystals are small, seldom larger than 10 μ in length, and transparent. The masses in which they are arranged constitute the irregular angular segments of the mosaic (Figs. 3 and 4). Cold potash gives the best specimens, but the crystalline structure can also be demonstrated after heating.

Mosaics from different patients show considerable variation in the regularity of the crystalline form. While some are composed of well-formed crystals, similar to those illustrated in Figs. 3 and 4, others have the constituent elements irregularly disposed. The plate-like structure of the mosaic elements is, however, usually discernible on careful focusing.

The crystals must not be regarded as an artefact incidental to the action of the potash, as by the following method they can be demonstrated in the dry scales without the use of that

* A paper read at the combined meeting of the Canadian and American Medical Associations, Atlantic City, Section on Dermatology and Syphilology, June 12, 1935.

This work was made possible by a grant from the Banting Research Foundation, Toronto.

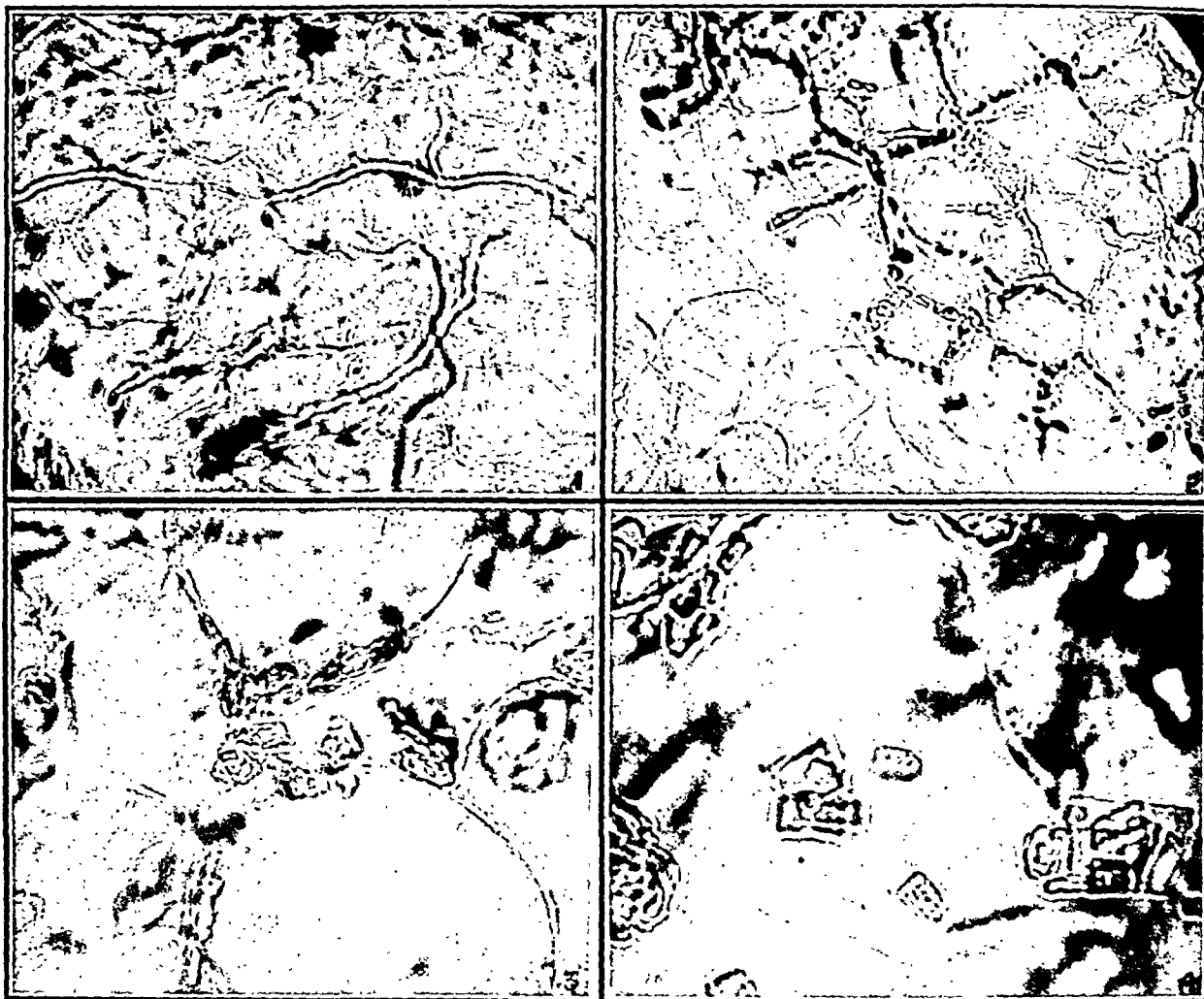


Fig. 1.—Scale from feet in potash, showing true hyphae of a dermatophyte. Mag. 460 diam. Fig. 2.—Scale from feet in potash, showing the so-called "mosaic fungus". Mag. 460 diam. Fig. 3.—Elements of the mosaic in scale cleared in potash, mounted in glycerine. Crystals to left of centre seen edgewise. Mag. 1000 diam. Fig. 4.—Elements of the mosaic in same preparation as Fig. 3, seen in surface view, showing re-entrant angles of cholesterol crystals. Mag. 1650 diam.

reagent. Dry scales are soaked in xylol to dissolve out the cholesterol. The xylol is then allowed to evaporate, whereupon the spaces formerly occupied by the crystals become filled with air. The scales are mounted in Gurr's neutral mounting medium. Between the dry epithelial cells is then seen an almost perfect mould of the crystals.

The mosaic consists of flat rhombic crystals, sometimes with a re-entrant angle, resembling cholesterol; it is insoluble in water, slowly disappearing on prolonged contact with strong potash; it is soluble in xylol and other fat solvents; it is found between the cells of the stratum corneum in certain cases of dermatitis of the hands and feet. The so-called "mosaic

fungus" therefore consists principally, if not entirely, of crystals of cholesterol. It is proposed that the structures should be re-named the *cholesterol mosaic*.

Whether the deposition of the crystals of cholesterol in the skin bears any relation to infection by ringworm fungi, or whether two distinct processes are involved is not yet known. It is, however, obvious that in the present state of our knowledge the presence of the cholesterol mosaic can no longer be regarded as evidence of infection by a dermatophyte.

REFERENCE

1. WEIDMAN, F.: Laboratory aspects of epidermatophytosis, *Arch. Dermat. & Syph.*, 1927, 15: 415.

FURTHER OBSERVATIONS ON THE ANTIRACHITIC EFFECT OF IRRADIATED FRESH MILK*

BY T. G. H. DRAKE, M.B., F.R.C.P.(C.), FREDERICK F. TISDALL, M.D., F.R.C.P.(C.)
AND ALAN BROWN, M.D., F.R.C.P.(C.),

Toronto

IN a previous communication¹ we reported upon the antirachitic effect of irradiated vitamin D milk on 141 infants. While 71 of these infants received only one pint of irradiated milk daily, 70 received their total milk requirements in the form of this milk. The observations were made under home conditions over a period of 5 winter months, the ages of the infants at the initial examination varying from 3 weeks to 8 months. We found that under these conditions no infants developed moderate or marked rickets.

In order to obtain further data upon the antirachitic effect of irradiated vitamin D milk under conditions comparable to those encountered by the physician in his every-day practice we have observed another group of infants. These were normal infants, living at home, and were practically all of British or northern European descent. Since we had found that the young infant is more susceptible to rickets than the older infant, the present observation was confined to infants 6 months of age or under at the

found to contain 94 international vitamin D units (35 Steenbock units) per 20 ounces. No other source of vitamin D was given. This was carefully checked by repeated questioning at the clinic by ourselves. In addition an exceedingly competent public health nurse made frequent visits in the homes, to be certain that the prescribed regimen was being followed. We were also able to observe 52 infants of similar ages who received no vitamin D.

The same procedure was followed as previously reported,¹ the infants being examined for evidence of rickets clinically and by x-ray of both wrists at the beginning, middle and end of the five months' period. The initial examination was made in October or November and the final examination in March or April. The infants were examined for the presence or absence of craniotables, costochondral beading, epiphyseal enlargement, and curvature of the long bones. Again we observed that there was no correlation between the presence or absence of rickets as evidenced by the x-rays and the above-mentioned

TABLE I.
AGES OF INFANTS IN MONTHS AT TIME OF INITIAL EXAMINATION

Group	Under 1 month of age	1 month of age	2 months of age	3 months of age	4 months of age	5 months of age	6 months of age	Total
Irradiated Pasteurized Milk	0	8	14	17	29	21	13	102
Ordinary Pasteurized Milk	0	7	12	16	9	7	1	52

initial examination (Table I). The infants were entirely bottle-fed and received all their milk requirements in the form of directly irradiated vitamin D milk, the amount varying with the age of the infant from 10 to 40 ounces daily. The irradiated milk was assayed by us at intervals throughout the period of observation and

clinical signs which are usually considered as pathognomonic of rickets. We found that moderate enlargement of the epiphyses and costochondral junctions and even marked craniotables were frequently present without any x-ray evidence of rickets. This is a most important point, as many previous observers have based their diagnosis of rickets on these clinical signs. With our present knowledge, it is only by means

* From the Department of Pædiatrics, University of Toronto, and the Hospital for Sick Children, Toronto.

of the x-ray that an accurate diagnosis of rickets can be made under clinical conditions.

At the conclusion of the period of observation the skiagrams were read. The interpretation was made without any knowledge of the amount of antirachitic material administered. Again the authors are greatly indebted to Dr. Martha Eliot, Acting Chief of the Children's Bureau, Department of Labour, Washington, for the interpretation of all the x-ray films. The degree of rickets was classified by Dr. Eliot as 1-, 1, 2 and 3. In this paper we have called Dr. Eliot's Group 1-, extremely slight rickets (a barely perceptible change which frequently might not be noted); Group 1, mild rickets (a slight but obvious rachitic change); and Groups 2 and 3, moderate and marked rickets (well-defined fringing and cupping at the end of the bone).

In Table II is shown the number of infants with evidence of rickets at the initial examination in the autumn.

In Table III is given the maximum degree of rickets observed at any time subsequent to the initial examination. Since the physician's aim is to prevent the development of rickets at any time while the infant is under his care, we are not only concerned with the degree of rickets at the final examination but also at any time during the period of observation.

In Table IV is shown the activity of the rachitic process during the period of observation. These figures of course apply only to those patients who showed evidence of rickets. By careful interpretation of the skiagrams it is possible to determine whether the rachitic process is in an active (progressive) stage or whether the process is healing. Also the presence of cured rickets can be determined.

COMMENT

From Table II it is evident that the number of cases of infants showing some evidence of

TABLE II.
CASES WITH EVIDENCE OF RICKETS ON INITIAL EXAMINATION IN AUTUMN

Group	Total number of cases	Extremely slight rickets	Mild rickets	Moderate and marked rickets
Irradiated Pasteurized Milk	102	19	5	0
Ordinary Pasteurized Milk	52	4	4	0

TABLE III.
THE EFFECTIVENESS OF IRRADIATED PASTEURIZED MILK IN THE PREVENTION OF RICKETS AS EVIDENCED BY X-RAYS

Maximum degree of rickets observed at any time subsequent to initial examination.

Group	Total cases	Extremely slight rickets		Mild rickets		Moderate and marked rickets	
		No.	Per cent	No.	Per cent	No.	Per cent
Irradiated Pasteurized Milk	102	14	13	13	12	0	0
Ordinary Pasteurized Milk	52	2	4	13	25	12	23

TABLE IV.
ACTIVITY OF THE RACHITIC PROCESS DURING PERIOD OF OBSERVATION

	Total cases	Autumn			Middle of winter			End of winter		
		Active rickets	Healing rickets	Cured rickets	Active rickets	Healing rickets	Cured rickets	Active rickets	Healing rickets	Cured rickets
Irradiated Pasteurized Milk	102	18	6	0	1	25	3	0	11	11
Ordinary Pasteurized Milk	52	5	3	0	12	8	0	17	7	0

rickets at the initial examination in the autumn, before any administration of vitamin D milk, was fairly equally divided between the two groups.

It is shown in Table III that not a single infant receiving its milk requirements in the form of irradiated vitamin D milk developed moderate or marked rickets, while no less than 23 per cent of the group receiving ordinary pasteurized milk developed rickets of this degree. In the classification used the cases of moderate and marked rickets are the only ones which would cause any great concern from the clinical standpoint, the milder degrees of rickets being largely of academic interest. It is to be noted that mild rickets was found in 12 per cent of the infants receiving irradiated vitamin D milk and in 25 per cent of the infants receiving ordinary milk.

The extremely slight rickets was found more frequently in the irradiated vitamin D milk group than in the ordinary milk group. However, in Table IV it should be noted that whenever rickets was found after the administration of vitamin D milk, with one exception, it was either in the healing or cured stage, while a comparatively large number of the infants receiving ordinary milk showed that the rachitic process was in the active or progressive stage. This indicates that the administration of the infant's milk requirements in the form of irradiated vitamin D milk either completely prevented the development of rickets or kept the rachitic process under control.

REFERENCE

1. DRAKE, T. G. H., TISDALL, F. F. AND BROWN, A.: A study of the relative antirachitic value of cod liver oil, viosterol and irradiated milk, *Canad. M. Ass. J.*, 1934, 31: 368.

THE USE OF STROPHANTHIN IN THE TREATMENT OF AURICULAR FIBRILLATION*

By H. E. RYKERT, M.D., M.R.C.P. AND JOHN HEPBURN, M.B., F.R.C.P.(C.),

Toronto

THE need often arises, particularly in hospital practice, for rapid slowing of the heart rate. This slowing can be obtained fairly quickly by giving large doses of digitalis by mouth, but, too often, such heart cases have a more or less extreme degree of passive congestion with nausea and vomiting. Passive congestion of the alimentary tract causes the absorption of digitalis to be inconstant both in degree and speed, and vomiting practically precludes the use of digitalis by the gastro-intestinal route. Until comparatively recently intravenous preparations of digitalis have been unsatisfactory, largely because of their inconstant action and partly because of the expense. We have found three of the preparations of the digitalis group reliable when given intravenously: (1) Digoxin (B. & W.), which is said to be a pure glucoside prepared from the leaves of the *Digitalis lanata*. It is supplied in ampoules for intravenous use, but has the minor drawback of requiring to be diluted with eight to ten volumes of normal

saline solution. (2) Strophanthin (B. & W.) in ampoules requiring no dilution. (3) Digifoline (Ciba). This latter preparation has been used little by us, since, unfortunately, the cost is greater than that of either digoxin or strophanthin.

There is a definite feeling in Canada, and to a less extent in the United States, that strophanthin is a dangerous drug, and it is therefore seldom used. Paul White¹ states that the dose of strophanthin is gr. 1/240 to 1/120, and advises that it should never be repeated within twelve hours. Poulsson² advises caution in the use of strophanthin intravenously. Cushny³ gives the dose as gr. 1/150, and warns that it is not to be repeated within twenty-four hours, and cautions against its use if digitalis has been given recently. He quotes Rahn as reporting 11 deaths from strophanthin intravenously, but 8 of the patients were receiving digitalis at the time and in the others the dose of strophanthin was too large. Wyckoff and Goldring⁴ report the use of strophanthin intravenously almost three hundred times. They usually gave an initial dose of gr. 1/120, followed by gr. 1/600 every half

* From the Department of Medicine, University of Toronto, and the Toronto General Hospital.

Read at the combined meeting of the Canadian and the American Medical Associations, Atlantic City, Section of Pharmacology and Therapeutics, June 12, 1935.

hour till the patient was digitalized. Slowing of the heart appeared in five to twenty minutes and reached its maximum in fifteen to fifty minutes. They found that febrile patients required larger doses of strophanthin. Toxic symptoms only appeared three times and then in mild degree.

For several years we have been using strophanthin intravenously with good results and without any mishaps in cases where rapid slowing of the heart seemed desirable (mainly in cases of auricular fibrillation). In this paper all the cases receiving strophanthin intravenously on the cardiac wards of the Toronto General Hospital during the past six months are reported. This group of cases is composed of 29 patients with auricular fibrillation, 2 with auricular flutter, 1 with auricular paroxysmal tachycardia, and 1 with a rapid sinus rhythm with occasional changes of the pacemaker. Only one of the patients had received digitalis within the previous two weeks, and several had never taken digitalis. All the patients, with the exception of a few who appeared to be too critically ill to wait, were kept under observation in bed in the electrocardiograph room for some hours before strophanthin was administered. Heart rates were frequently checked electrocardiographically and by præcordial auscultation before and during the first two hours after the administration of strophanthin. Note was also taken of palpitation, cyanosis, nausea, vomiting, and both subjective and objective dyspnœa. Strophanthin was always given intravenously, and the dose was always gr. 1/100, with the exception of one case, a boy of sixteen years of age who was given gr. 1/200, which was repeated in ninety minutes. The standard dose (gr. 1/100) was repeated in many of the cases in an hour and in one case of auricular flutter was given three times at intervals of one hour.

These 33 patients were given almost 200 doses of strophanthin. Vomiting occurred on four occasions, each time in a different patient. Two of these patients were vomiting shortly before receiving strophanthin, and one of the two other patients vomited on only one occasion, although she had had over 100 doses of strophanthin. In this patient, digitalis and strophanthin by mouth had no effect. She was a girl of 18 with a huge rheumatic heart, fibrillating at

rates varying from 140 to 200 per minute. One patient died twenty minutes after receiving a single dose of strophanthin. She was the case referred to earlier who had received digitalis recently. For several hours before strophanthin was given she had been unconscious and moribund. Auricular fibrillation with a ventricular rate of 144 was present and ten minutes after the strophanthin was administered the rate fell to 124, ventricular extra-systoles appeared, followed by runs of ventricular tachycardia and, finally, ventricular fibrillation. While it is known that an overdose of digitalis may be followed by such a sequence of events, it is also known that these changes in rhythm may occur spontaneously just before death. It is difficult, therefore, to estimate what part was played by strophanthin in this death. It is likely, however, that the fatal issue was hastened by strophanthin in a patient who had been receiving digitalis recently.

Results in 29 patients with auricular fibrillation.—The average initial heart rate in these cases was 153 and the average minimum rate after one dose of strophanthin (a few patients had two doses) was 97 per minute. In all but two cases a very definite decrease in heart rate followed the initial dose of strophanthin. In these two cases the first dose had no effect, but a similar dose two hours later resulted in a marked fall in rate. One of these patients had pneumonia, with a temperature of 105.6° F. Another patient with rheumatic heart disease with failure, a temperature of 102° F. and hyperthyroidism, received four doses of strophanthin within ten hours. The first and last doses gave a marked but temporary fall in heart rate, but the second and third doses had no effect. Venesection a few hours later brought the heart rate down, and it was then readily controlled with digitalis.

A definite and at times marked diminution in heart rate appeared in from five to ten minutes, and occasionally in three minutes. The maximum effect appeared in from twenty minutes to two hours, usually within one hour. When a second dose was given within two hours of the first dose the maximum effect was usually obtained about ten minutes after the second dose. Four of the patients were febrile and in three the strophanthin had to be repeated to obtain a satisfactory reduction of heart rate.

As might be expected, with the decrease in heart rate the patients showed marked improvement in the dyspnoea, palpitation, cyanosis, and respiratory rate.

Results in patients without auricular fibrillation.—Strophanthin was given intravenously to two cases of auricular flutter, in an attempt to restore normal rhythm via auricular fibrillation. The first case with a ventricular rate of 102 fell to 86 in three minutes and at the end of an hour was seventy-six. A similar dose of strophanthin was then given and resulted in a fall to 60 in half an hour. At the end of an hour, the rate being still 60, strophanthin was again repeated and the rate became 54 in fifteen minutes and was 56 at the end of one hour. Next day, when the rate was 64, another dose of strophanthin caused a fall to 54 in fifteen minutes. At the end of an hour the rate was 56. As the ventricular rhythm was now very irregular, with long pauses, it was deemed inadvisable to continue with strophanthin. This patient had no toxic symptoms. The second case of auricular flutter had an irregular ventricular rhythm with the rate varying from 74 to 80. Ten minutes after strophanthin was given, the rate was 60 to 68 and in an hour was 58 to 60, with long ventricular pauses. Strophanthin was not repeated. Normal rhythm was restored by the use of quinidine sulphate in both cases. In neither case did strophanthin reduce the auricular rate.

A febrile case of luetic aortitis with sinus rhythm, with occasional changes in the pacemaker, started with a rate of 152, which fell to 120 fifteen minutes after a dose of strophanthin. The rate remained at this level and was later lowered further by digitalis by mouth.

Strophanthin was used intravenously in one case of persistent paroxysmal auricular tachycardia with degenerative heart disease, angina pectoris and congestive failure. The initial rate was 160 and fell to 80 with sinus rhythm in ten minutes. Unfortunately, no observations were made during these ten minutes. Cyanosis cleared up and dyspnoea was much lessened. It is, of

course, an open question as to what, if any, part strophanthin played in this result.

SUMMARY AND CONCLUSIONS

A uniform dose of strophanthin, gr. 1/100, was given intravenously over 200 times to 33 patients, of whom 29 had auricular fibrillation. One patient developed ventricular fibrillation and died twenty minutes after receiving strophanthin, but she was unconscious and moribund at the time strophanthin was given, and had recently been taking digitalis. Vomiting occurred in four patients, two of whom were vomiting before the drug was used. The results agree with those of Wyckoff and Goldring, in that: (1) a large dose of strophanthin is safe intravenously if digitalis has not been recently administered; (2) febrile patients require larger doses; (3) a definite reduction in heart rate is usually obtained in five to fifteen minutes, reaching a maximum in twenty to sixty minutes; (4) vomiting is rare. This dose of strophanthin can be repeated with safety in an hour if necessary, but we suggest that it should not be repeated until the rate has reached a stationary level or has started to increase.

We therefore recommend strophanthin as a convenient, effective, cheap, and safe drug for intravenous use when rapid reduction of the heart rate is desired (especially in cases of auricular fibrillation) or when vomiting or marked passive congestion renders the use of the alimentary route impossible or doubtful.

In view of the one mishap which might have been due to strophanthin plus digitalis, we wish to stress the warning given by others (Cushny, and Wyckoff and Goldring) against using strophanthin intravenously when digitalis has been taken recently.

REFERENCES

1. WHITE, P.: *Heart Diseases*, Macmillan, New York, 1931, p. 583.
2. POULSSON, E.: *Pharmacology and Therapeutics*, Williams and Wilkins, Baltimore, 1923, p. 162.
3. CUSHNY, A. R.: *Digitalis and Its Allies*, Longmans Green, London, 1925, p. 267.
4. WYCKOFF, J. AND GOLDRING, W.: Intravenous injection of ouabain in man, *Arch. Int. Med.*, 1927, 39: 488.

HORMONES AND LACTATION.—W. Sawizki, recalling that physiological lactation becomes established about the same time that the content of folliculin and prolactin in the maternal fluids begins to diminish rapidly, decided to try the injection of these hormones in puerperal patients in whom it was desired to stop milk secretion. After injections of 200 to 800 units of the former and

50 to 100 of the latter it was found in the great majority that the breasts remained soft and after four or five days ceased to secrete. The intramuscular route of injection was less painful than the subcutaneous ones. Trial is now being made of rectal injections of pregnancy urine.—*Zentralbl. f. Gynäk.*, Nov. 23, 1935, p. 2784. Abs. in *Brit. M. J.*

NEUROSYPHILIS*

BY J. C. HOSSACK, M.D., C.M.,

*Lecturer in Medicine, University of Manitoba;
Associate Physician, St. Boniface Hospital (in charge of Neurology)*

AND S. C. PETERSON, M.D.,

*Demonstrator in Venereology;
Director of the Government Venereal Clinic in St. Boniface Hospital,
Winnipeg*

AN all-inclusive title, such as "Neurosyphilis", suggests a general rather than a particular discussion of the condition. It is our intention to discuss it generally, but our object, particularly, is to arouse the interest of general practitioners in this disease. The fate of a patient lies largely in the hands of the physician first consulted. The responsibility for recognizing neurosyphilis therefore lies chiefly with the men in general practice, and many of them regard neurosyphilis as a rare disorder which they seldom encounter. Yet, is it rare? Would it not be more correct to say that because it is seldom thought of it is often missed? During the past few months we have had some striking support for such a belief. A young man admitted for a trivial disorder was found on routine examination to have early neurosyphilis. A middle-aged man complaining of abdominal pain which appendicectomy and cholecystectomy had failed to remove was suffering from gastric crises. Four men between the ages of 35 and 50 years, with typical tabetic pains, said that they had been treated for years for rheumatism or neuritis or sciatica. Three others who had been dieted for peptic ulcer or gall bladder disease were found to be suffering from neurosyphilis. All of these patients had had medical advice, but in no instance had any suspicion of syphilis arisen. Examples such as these force us to believe that syphilis is very frequently forgotten. We feel that the general practitioner is not much interested in the disease, particularly its nervous manifestations. It is therefore to him that we address ourselves. We cannot in a few minutes tell him a great deal, but we can refresh his memory and, let us hope, disturb his apathy.

It is surprising that syphilis evokes such little interest. It is without question one of the commonest and most serious of diseases. This should make it of prime importance to everyone, lay or professional. But, more than this, it is curable. There are a few disorders, not surgical or self-limited, that are curable, certainly none of the same magnitude as syphilis. Moreover its course can be arrested at any stage. Yet in spite of these facts, in spite of the fact that every doctor has at his disposal the means of diagnosis, arrest and cure, patients are allowed to drift into the more serious phases of the malady. Often the fault lies with the patient, who turns deaf ears to our advice, but not infrequently the blame lies with the doctor. May we suggest that physicians generally are not so familiar as they should be with the phenomena of the disease?

There is, to be sure, some excuse. Of all diseases syphilis is the most subtle. It seldom obtrudes itself upon the consciousness of its victims. There is no warning cough, as in tuberculosis, no suspicious lump, as in cancer, to put one upon his guard. Like the bore-worm which slowly and insidiously disintegrates the supporting timbers without betraying its existence, so does syphilis permeate and destroy the most vital tissues, while cloaking its presence under some innocent guise. Syphilis is a master of disguise. There is no symptom which it cannot cause, no syndrome for which it may not be responsible. It is a simulator of all diseases. It can mask itself so completely and so successfully that neither doctor nor patient suspects its presence. Quite often there is no reason to regard syphilis as likely. Sometimes a patient will readily admit previous infection, but will point to a course of treatment as evidence of a cure. To be curative, however,

* Read at the Fort William meeting of the Manitoba and Ontario Medical Associations, May, 1935.

the treatment must have been adequate, and not infrequently it has not been adequate. Inadequate treatment is in some respects worse than none. It gives the patient a sense of security which is false, and so deters him from actively pursuing the course. Such a treatment does not cure; it merely "skins and films the ulcerous place whilst rank infection, mining all within, corrupts unseen". It is the fertile and prolific cause of neuro-recurrence.

Syphilis can thus be easily missed unless one keeps its possibility in mind. The bewildering array of syndromes which it can produce, its tendency to mask itself, its insidiousness, increase the difficulty of its recognition. On the other hand, an appreciation of its seriousness, of its mischievous assiduity, of the fact that it can be cured, increases the responsibility of the physician. He must unearth the evidence himself. Unlike cancer and tuberculosis, where the patient can help him greatly, in syphilis the patient can help him but little. The routine Wassermann test, which detects so many unsuspected cases among the indigents, could do equal service for those who compensate us for our labours.

It is difficult to be sure of the exact prevalence of syphilis, but the most conservative authorities consider it to be present in not less than 5 per cent of the population. Some time ago we found that close upon 7 per cent of all those admitted to our general clinics had positive Wassermann reactions. According to official figures, each year yields a crop of 500,000 new cases in the United States. Parran places the actual number in the vicinity of 870,000. What the figures for Canada may be we do not know exactly. Even if the incidence in this country were but a twentieth of that in the United States the number would be immense, and far in excess of the totals for cancer and tuberculosis together. Of this huge number not all will develop neurosyphilis, but every one of them is a potential neurosyphilitic. According to Stokes the percentage of positive spinal fluids after a year without treatment or after inadequate treatment is from 25 to 30. So very many new cases each year and such a large percentage of them threatened with nervous disasters, great or small! Surely neither as regards numbers nor in gravity can neurosyphilis be dismissed as insignificant.

There is but one way of escape for those who find themselves upon this slippery path—the way of adequate treatment.

Opinions differ as to what is meant by adequate treatment. The method employed for the past eight years in the Syphilis Clinic at St. Boniface Hospital has proved quite successful. It aims at the removal of danger, both actual and probable, and, we believe, achieves its aim. The course followed is one year of continuous treatment, consisting of 30 injections of "914", and 30 injections of bismuth, given by the alternating or overlapping method with no rest periods. At the end of six months the blood Wassermann is taken. If it is positive a spinal fluid examination is also made: if negative, the routine treatment is continued. At the end of the year's treatment the spinal fluid is examined in every case for cells, globulin, colloidal curve and Wassermann reaction. Provided the serological responses are satisfactory, the patient is then given a three months' rest. Two courses of 10 injections of bismuth, with or without "914", are given in the second year.

A course such as we have outlined will protect the patient against nervous involvement. The examination of the spinal fluid is all important. It is there that changes first occur. Such changes as increased cell count, increase in globulin, and positive colloidal or Wassermann reactions may long antedate the appearance of definite signs. A fact never to be forgotten is this: *the first evidences of neurosyphilis are to be found not in the patient but in the test tube, and search for them must never be omitted.*

The nervous system is not always destroyed, but it is always attacked. This is only to be expected. The spirochætes favour especially those tissues which are derived from the ectoderm, and the nervous system is ectodermal in origin. In any case, it would be hard for the nervous structures to escape at least invasion. Even in so short a time as 48 hours after infection the organisms have found their way into the spleen and bone marrow. They can be recovered from otherwise normal spinal fluid at a time when no lesion is visible upon the body. Fortunately, invasion does not always mean involvement. Many, indeed most, patients will repel the attack and emerge un-

scathed. The difficulty is to know which patient will and which will not repel the invader. As we have no way of answering this question, we must regard everyone as being potentially in jeopardy until we are satisfied beyond a peradventure that he is safe.

When gross involvement of the nervous system occurs we may be confronted with any syndrome. The syndrome of neurosyphilis is of infinite variety. There is rarely a clear-cut picture. The signs and symptoms produced depend upon the sites attacked, the tissues involved, and the rate of progress. The spirochæte spares no part of the central nervous system, and it can invade it in so scattered and irregular a fashion that the most bizarre pictures may result.

We speak of vascular and meningeal and parenchymatous types as if these were mutually exclusive, but this is not so. When the vessels are affected so also are the meninges about them and the brain tissue they supply. Thus general paralysis of the insane occurs most often in our experience without paralysis or insanity. We prefer therefore the name given by Bulkley Sharp—"chronic syphilitic encephalitis". This stresses the pathological rather than the clinical features. Sometimes acute, sometimes subacute, sometimes chronic, the syndromes of general paresis of the insane, tabes, and myelitis blend in a bewildering fashion. Thus simple classification is difficult and exact classification cumbersome. For our present purpose it is desirable to make grouping as simple as possible, and so we prefer to call the disease as a whole "neurosyphilis", with 3 sub-groups—*asymptomatic*, *early* and *late*. This classification has the advantage of focussing attention on treatment.

It is the *asymptomatic* cases which we should look for, because in them the results of treatment are so good. These patients reveal their condition only in their spinal fluids. *Asymptomatic neurosyphilis* can be detected by routine spinal fluid examinations during treatment. It can also be discovered in checking the fluids of patients who give histories of previous infection. The first sign to appear is an increase in the cells over the normal 5 or 6. Later there will be positive mastic and Wassermann reactions. The routine spinal fluid examination is of supreme importance. A negative blood Wasser-

mann test does not mean a negative fluid. Puncture should regularly follow at the end of the first year. Positive findings change the complexion of the whole picture. We are now faced not by syphilis but by neurosyphilis. Patients who demur at puncture should be urged by every argument within our power to submit to what, for them, may be a life-saving measure.

In so far as neurosyphilis is concerned the laboratory must be our chief ally. It alone can warn us of the enemy within the gates; it alone holds the crystal wherein are mirrored the portents of the future. Even the earliest physical signs of neurosyphilis are given by tissues already greatly damaged. Our object should be to anticipate these signs, to forestall that damage. Indeed, our prime object is prevention, for prevention is so much better than cure. "The knowledge of danger", says Seneca, "is the beginning of safety". Only from the spinal fluid can be obtained that knowledge; only by heeding its warnings can we achieve that safety.

The treatment of *asymptomatic* patients begins with a course of 8 to 12 malarial chills, the number depending on their severity. Then after 2 to 4 weeks' rest a course of 8 to 10 weeks' treatment with small doses of neoarsphenamin is given, with full doses of bismuth and iodides, followed by the pentavalent arsenicals. A re-check of the fluid in six months will probably show the danger to have passed.

Among the early manifestations of neurosyphilis perhaps the most serious is that which attacks the brain vessels. The danger lies in two facts. First, the blow falls quickly after infection, often within a few months. Secondly, the victims are young men whose budding ambitions are sharply nipped by the bitter frost of paralysis. Syphilis does not usually treat its recent captives so harshly; it prefers, cat-like, to toy with them, to threaten them, to destroy them piecemeal. But in this instance it quickly thickens the vessel walls, so that barely a trickle of blood can pass, and then that tiny opening is barred and the blow falls.

During the process of gradual occlusion, and chiefly towards its end, the patient complains of headache, dizziness and insomnia. His character may also change. Such symptoms are ominous, and any or all of them, when not

obviously due to some other apparent cause, should arouse suspicion of lues. No severe, persistent headache should escape the blood Wassermann test. No alteration of personality should ever be dubbed "overwork" or "neurasthenia" until syphilis has been searched for and excluded. We must be quick to suspect, slow to exonerate. A timely serological examination may easily prevent disaster. The paralysis, hemiplegia, aphasia, or other resulting condition may clear up but not infrequently persists. Treatment then can prevent further damage, but cannot always repair the damage already done.

Apart from the symptoms just enumerated there are two others which may be early, and which should always arouse suspicion—lightning pains and gastric crises. Lightning pains are not always severe. Often they are missed because this is forgotten. The pains may be of such agonizing severity that strong men groan under them, but not infrequently they are no more distressing than the rheumatism or neuritis for which they are so frequently mistaken. The peculiarity of tabetic pains lies not in their severity but in their distribution, their direction of propagation, and especially in their arrangement in time. Collier describes them thus:

"As a rule they come on in attacks in which momentary pains are repeated at intervals of a few seconds or minutes for several hours, the whole bout lasting several days or weeks. Between the attacks there may be long intervals of complete freedom from pain. The pains are felt most in the lower limbs. They are very common in the bony prominences around the knee or the foot. The direction of radiation varies, but most often it seems to strike the limb vertically as if a sharp object were piercing it from without. The onset of the pain is always sudden. The duration of each pain is usually momentary. During a bout the pains usually recur in the same place each time for several hours on end. After a bout the skin is often left tender, and ecchymoses may appear over the parts in which the pain was felt."

When gastric crises occur in the absence of other tabetic symptoms they are very likely to be overlooked and needless operations to be performed. The true significance of these pains can, however, be revealed by a painstaking search for signs of neurosyphilis, which are very rarely absent.

Signs are three times as common as symptoms in neurosyphilis. In the early cases the signs are notoriously inconspicuous. They must be sought for deliberately. But it is so important

that these early evidences be sought for that we urge their inclusion in every routine examination. A highly significant sign is the absent ankle-jerk. The knee-jerk is not nearly so reliable a guide. The tendo Achillis can be vigorously compressed without pain. Pin-prick sensation is lost on the nose and in the saddle area. There are similar disturbances of sensation along the ulnar border of the arms, across the chest and in the feet. From these centres the area of involvement spreads over the body. Testicular sensation is diminished or lost. The vibrations of a tuning fork cannot be felt in the legs. The eye reflexes become sluggish and finally absent. Ataxia may be slight. The superficial reflexes are unduly active. Nor must we forget the psychic changes which may be forerunners of general paresis of the insane.

These are the more significant of the earlier signs. Any may be absent, all may be present, and others may be added. The gross signs appear later. Diagnosis from them is simpler, but they point to massive destruction. They are the charred embers of the ruined building; they are the tombstones which mark the scar-tissue graves of cells and fibres killed by the poison of the spirochæte.

Even then treatment is worth while, for it can at least stop the progress of the disease. There may even be some improvement, especially in cases of general paresis of the insane. For the early cases treatment is similar to that outlined for the asymptomatic patient. First, a course of chills, 8 to 12 in number. Opinions differ as to the indications for pyrexial therapy. We are persuaded that it is indicated in every case of neurosyphilis except in the acute, meningeal and vascular forms. Severe disease elsewhere is also a contraindication. But the otherwise healthy neurosyphilitic, young or middle-aged, stands the treatment well, spontaneously voices his improved well-being, and reveals in serological changes the benefit he has received. So far we have employed malaria in over 200 cases without death or even minor mishap. The height of improvement appears to occur between 6 months and a year after treatment.

The malarial course is followed by a short rest. Then the patient is given a course of neoarsphenamin, bismuth, and iodides for 10 weeks, after which tryparsamide in doses of 1 to 3

grams is continued for 6 months. The eyes are of course checked during the treatment with tryparsamide. Ninety per cent of the spinal fluids are negative at the end of this course.

There is one objection to malaria treatment—it requires facilities not everywhere available. We have lately been using typhoid vaccine in divided doses, after the method of Cole and Driver. We have found it possible to maintain a fever of 9 hours' duration with a fastigium of 5 hours. Increasing amounts of the typhoid vaccine are given every second day until 10 or 12 chills have been experienced. This method is exceedingly convenient for those who are remote from cities, and where malaria cannot be obtained. The therapeutic value of typhoid has, however, yet to be determined. If fever alone causes the beneficial effects it should produce results equal to those of malaria. But it is possible that the plasmodium itself plays a rôle, and so far we prefer malaria.

There is however another aspect of the treatment of neurosyphilis which is concerned neither with malaria nor with arsenic, but is even more important than these. You are doubtless familiar with the aphorism that the first step in treatment is diagnosis, and the second is diagnosis, and the third is diagnosis. This is almost true, but not quite. The first step is having the condition in mind—a disease-consciousness. The most powerful weapon in the war against cancer is the tremendous consciousness that cancer exists, that it is a terrible thing, and that it must be destroyed. Such an attitude keeps one ever on the alert to detect the earliest beginnings of malignancy. Even if a doctor were to become forgetful, a cancer-conscious public would not allow it. This cancer-consciousness of the public acts as tremendously powerful *vis a tergo* which drives the profession to make vigorous attack. Unfortunately no such *vis a tergo* exists for the eradication of syphilis. To use an Americanism, syphilis is at the same time the "forgotten man" and "public enemy Number One". Tuberculosis-consciousness has forced down the incidence of tuberculosis; cancer-consciousness will do the same for cancer. What might we not accomplish were we conscious of syphilis? Is it not a little paradoxical that we should be so tremendously conscious of cancer and tuber-

culosis, which for the most part we can only treat, and so indifferent to syphilis which we can cure? And we are indifferent, for otherwise how could we encounter so many patients with neurosyphilis who have been operated on for gall stones, peptic ulcer, appendicitis, ovarian and tubal disease, and so on, or who have been treated for other ailments which did not exist? The commonness of syphilis must be more thoroughly appreciated. From the standpoint of numbers it outranks cancer or tuberculosis, and probably both together. Can we say that its seriousness is one whit less? In fact, is it not even greater, capable as it is of infinite mischief, sparing neither age nor sex, neither body nor mind? Surely then so common and monstrous a disease must be attacked with our utmost energy, and surely the prevention of its grave and frequent nervous manifestations deserves our most strenuous efforts. The first step in the treatment of neurosyphilis is the development of a syphilis-consciousness. The second step is the early diagnosis of the systemic infection. The third step is adequate treatment before involvement of the nervous system occurs. When this is done there will be few complications to treat.

This is the aspect we wish to emphasize—that neurosyphilis is much better treated by prevention. But such prevention depends greatly upon the consciousness of the physician towards neurosyphilis. He must regard it as he regards cancer or tuberculosis, as a condition which he may see at any time and which it is his serious responsibility to recognize. He should not consider his examination complete unless it makes search for the early signs of the disease, and he should consult the laboratory on the slightest provocation.

Let us insist again—we do not speak to the neurologist or the syphilographer, to whom the vagaries of the spirochete are a matter of daily concern; we speak to the general practitioner who can do so much, if he only will, to prevent the deplorable tragedies wrought daily by syphilis. His attitude towards the disease must not be one of tolerance or indifference but of active antagonism. When such an attitude exists among practitioners at large, neurosyphilis will become, as it should become, the rarest of rarities.

PRIMARY CARCINOMA OF THE JEJUNUM

By JOHN E. PLUNKETT, M.D.* AND MAURICE P. FOLEY, M.D.,

Fellows in Medicine, The Mayo Foundation,

AND ALBERT M. SNELL, M.D.,

*Division of Medicine, The Mayo Clinic,**Rochester, Minn.*

THE small intestine appears to have a remarkable immunity from primary carcinoma, lesions of this type being rarely encountered, even in large institutions with ample surgical and necropsy material.

D'Allaines¹ (1929) collected and reviewed 114 cases of primary carcinoma of the small bowel. Twenty-six of these cases were encountered at The Mayo Clinic and were reported from the pathological standpoint by Craig¹ (1924). Rankin and Mayo⁶ (1929) collected and reviewed 55 verified cases of primary carcinoma of the small bowel from the clinic, including 24 reported by Judd⁶ in 1919. Fourteen additional cases have been verified at operation or necropsy since their report was published, which brings the number of such cases seen at the Clinic prior to February 1, 1935, up to 69. We have found 52 other reported cases, which brings the total in the literature up to well over 200, but we have not attempted any critical analysis of these cases, inasmuch as this ground has been thoroughly covered, especially by d'Allaines,¹ Kiefer,⁷ Porzelt,⁸ Rankin and Mayo,⁹ and Sowles.¹⁰

Ewing⁵ reported that 8.56 per cent of all intestinal carcinomas originate in the small bowel; slightly more than half of these arise in the duodenum; the remainder, at various points in the jejunum and ileum. The distribution of carcinomas of the small bowel which has been observed at the Clinic gives a somewhat different ratio, which is not remarkable when one considers the small size of the group from a statistical standpoint (Table I). There were 47 males and 22 females in this series, their ages varying from 32 to 69 years. Their average age at the time of examination was 49.8 years.

Symptoms.—The onset of symptoms is usually insidious when the patency of the intestinal

lumen is not impaired. With non-obstructing lesions the early symptoms are usually those of weakness, loss of weight, and easy fatigability, due presumably to occult hæmorrhage and interference with the absorptive function of the small bowel. Anæmia is frequently the earliest sign. In the stenosing type the symptoms are those of high intestinal obstruction, and such symptoms may be gradual and progressive or recurrent and acute. In the former case, pain is usually present. This may be diffuse, but as in other cases of lesions of the small bowel it tends to be

TABLE I.
SITUATION OF PRIMARY CARCINOMAS OF SMALL BOWEL IN SIXTY-NINE CASES AT THE CLINIC

<i>Situation</i>	<i>Judd</i>	<i>Rankin and Mayo</i>	<i>Present series</i>	<i>Total</i>
Duodenum.....	5	10	5	20
Jejunum.....	11	10	7	28
Ileum.....	6	8	2	16
Multiple.....	2	1	..	3
Undetermined.....	..	2	..	2
Total.....	24	31	14	69

centred about the umbilicus; it may be sharp or dull and aching, and it sometimes seems to shift about in the abdomen; it has an inconstant relationship to the taking of food, and may come on at a variable time after meals; and it does not seem to be relieved by food, milk, or alkalis. When the obstruction is recurrent or acute, intermittent and severe abdominal cramps, nausea, and vomiting occur. The vomitus usually contains bile, indicating that the obstruction is, as a rule, below the papilla of Vater. A mass is seldom felt in the abdomen, and when present may be of the type that seems to slip away from the examining hand.

Pathological characteristics.—The most common type of lesion is the annular constricting adenocarcinoma which invades all coats of the

* Now residing in Ottawa.

bowel. Colloid carcinomas have been reported. The lumen of the bowel is invaded by the tumour, which is usually ulcerating. Dilatation of the bowel above the point of constriction occurs as the lumen becomes occluded. Some ulcerating types of lesions may not produce obstruction, and this is particularly so for carcinomas arising as polypoid growths within the lumen of the bowel. Such lesions are likely to be multiple. Metastasis involves, first, the mesenteric lymph nodes and the peritoneum, then the liver, lungs, long bones, and spinal dura, in that order. In

Rankin and Mayo's cases serious metastatic involvement of the peritoneum and lymph nodes was found at operation in a third of the cases.

Diagnosis.—Recognition of the fact that pain arising from lesions of the small bowel is more or less characteristically referred to the umbilical region, and that it usually bears some relation to the taking of food, is important. The suspicion of an intestinal lesion should lead to roentgenological examination, which may identify an obstructing or ulcerating lesion in the duodenum; localization of a lesion in the jejunum is more

TABLE II.
DATA IN THIRTEEN CASES OF PRIMARY CARCINOMA OF SMALL BOWEL

Case	Age, years and sex	Principal symptoms	Duration of symptoms, months	Blood			Total acidity	Free hydrochloric acid	Site of lesion	Operative and pathological findings	Outcome
				Hemoglobin, per cent	Erythrocytes, millions	Leukocytes, per cubic millimetre					
1	32 F	Colics, vomiting	36	56	4.25	7,400			Ileum	Mass with dilatation; carcinoma, grade 2	
2	45 M	Cramps, distention	9	40	3.71	7,200			Jejunum	Obstructing mass	
3	64 M	Constipation, anaemia	24	49	3.92	10,300	10	00	Jejunum	Perforating, obstructing mass; metastasis to liver	
4	53 M	Nausea, vomiting	2	78	4.62	8,300	34	24	Duodenum	Perforating duodenal lesion; primary adenocarcinoma	
5	65 F	Cramps, melæna	1	72	4.51	5,500	66	54	Duodenum	Adherent nodular mass; adenocarcinoma, grade 2	
6	49 F	Cramps, vomiting	7	75	4.90	6,800	20	00	Jejunum	Annular constricting mass; adenocarcinoma, grade 2	
7	59 M	Aching pain	5	71	4.32	9,820			Jejunum	Annular obstructing mass; carcinoma, grade 3	Died in two months
8	48 M	Cramps, vomiting, diarrhoea	12	28	3.51	6,700	62	42	Ileum	Constricting annular mass; adenocarcinoma, grade 2	Operated on return 4½ years later
9	46 F	Vomiting, loss of weight	5	100	4.50	17,200	18	00	Jejunum	Annular obstructing tumour; adenocarcinoma, grade 2	Died
10	43 M	Weakness, loss of weight, cramps	48	50	3.83	7,900			Jejunum	Obstructing tumour; papillary adenocarcinoma, grade 3	
11	45 M	Weakness, melæna, cramps	12	14	2.38				Duodenum	Adenocarcinoma of duodenum: no operation	Died
12	57 M	Constant abdominal pain, jaundice	7						Duodenum, 1 cm. from pylorus	Adenocarcinomatous ulcer of duodenum	Died
13	67 M	Abdominal pain, "sour stomach"	?				30	00	First part of duodenum	Perforating lesion at pylorus; perforating adenocarcinoma	Died

difficult. Obviously, a barium meal should not be given in the presence of obstruction, either actual or impending. In cases in which pain is minimal attention may be called to the possibility of an intestinal lesion by the presence of anæmia and by the demonstration of blood in the stools. In the case to be presented characteristic pain and marked anæmia led to a correct pre-operative diagnosis.

Prognosis.—No patient in Rankin and Mayo's series lived longer than three years. The duration of life after establishment of the diagnosis ranged from one month to three years, the average being less than a year.

Treatment.—Surgical exploration obviously is desirable, in the hope that the tumour may be resectable. If a radical procedure is impossible, palliative entero-anastomosis may produce some symptomatic relief.

Of the 14 cases of carcinoma of the small intestine which have been observed at operation or necropsy at the Clinic since the publication of Rankin and Mayo's report, only one will be reported in detail. The important features of the remaining 13 cases will be found in Table II.

CASE REPORT

The patient was a locomotive engineer, aged fifty years, who registered at the Clinic on December 29, 1934, complaining of intermittent colicky abdominal pain and of severe anæmia. He had been receiving ventriculin and liver treatment at home for this condition during the preceding seventeen months. The family and personal history did not reveal anything of significance, there being no record of anyone in his family having had cancer or tuberculosis. In 1924 he had had diarrhœa of short duration, at which time a diagnosis of "colitis" had been made. No other illnesses were recorded.

The patient stated that, about August, 1933, he had first begun to notice some shortness of breath on exertion, which had continued and increased during the autumn and winter of 1933 and 1934. He had become progressively fatigued, and even after sleep had seldom felt completely rested. In May, 1934, he had been compelled to stop work on account of general weakness. One month earlier he had first consulted his home physician, who had made a tentative diagnosis of pernicious anæmia and had treated him with liver extract, ventriculin, and jeculin, but without much improvement in the anæmia. He had not had sore tongue, paræsthesia, or diarrhœa.

The patient had first noticed colicky abdominal pain in April, 1934. This pain was cramp-like, and was felt in and around the umbilicus and in the lower left quadrant of the abdomen; it had not been projected, however, through to the back, up under the costal margins, or down into the testes. It tended to come on after the ingestion of cold drinks; warm foods caused little distress. The interval between the taking of food and this pain was only a few minutes. Heat applied to the abdomen would produce greater relief than the taking of food or alkali. There were no accompanying urinary disturbances. The bowels were regular and the stools, according to the patient's statement, were normal. His appetite had been fairly good until a month prior to

registration, when anorexia was first noted. He had lost only about 6 pounds.

Physical examination.—On admission the patient appeared well nourished. He was 72 inches in height and weighed 194 pounds. The systolic blood pressure in mm. of mercury was 110, and the diastolic 65. The pulse rate was 100 beats per minute and there was no fever. The skin was slightly yellowish and the mucous membranes were pale. The pupils reacted to light and to accommodation. The tonsils had been removed. There was pyorrhœa alveolaris of slight degree. The tongue was slightly reddened and smooth. The thyroid gland and superficial lymph nodes were not palpable. The heart and lungs were normal. Slight tenderness was present in the abdomen to the left of and below the umbilicus. No organs or masses could be palpated. Rectal examination was negative. The deep reflexes were present and equal on both sides. Sensation appeared to be normal, and the vibration sense over the bony points of the lower extremities was unimpaired.

Röntgenological findings.—Roentgenographical studies of the stomach gave negative results at the first examination, as did those of the colon and terminal portion of the ileum. Subsequent re-examination with a barium meal revealed an ulcerating lesion in the distal portion of the duodenum or proximal portion of the jejunum. Examinations of the thorax and skull were negative.

Laboratory findings.—Examination of specimens of the gastric contents aspirated at intervals after an Ewald meal did not reveal free hydrochloric acid (Töpfer's method). After stimulation with histamine only slight traces of free hydrochloric acid were found in two specimens out of eight aspirated. The total acidity varied between 22 and 38 units, and 108 c.c. were recovered in eighty minutes. The serological test for syphilis was negative. Urinalysis was negative. There were 8.5 g. of hæmoglobin per 100 c.c. of blood, and the erythrocytes numbered 3,130,000 and leukocytes 8,600 per cubic millimetre. Differential count: lymphocytes 12.5 per cent, monocytes 5.5 per cent, and neutrophils 82 per cent. Hypochromasia was marked and anisocytosis and polychromatophilia were slight. Smears were examined on different occasions. No evidence of the characteristic blood picture of pernicious anæmia was obtainable. A hypochromic type of anæmia was diagnosed. The calcium and phosphorus content of the blood serum was normal, the values being 9.0 and 4.4 mg., respectively, per 100 c.c. Serum protein was 6.4 mg. per 100 c.c. Two specimens of the stool were negative, whereas four others were positive for blood with guaiac; there was no excess of fat or oil in the stools and no parasites or ova. Three specimens of the stool were cultured, with negative results. A provisional diagnosis of primary carcinoma of the duodenum was made.

Operative findings and post-operative course.—The patient was operated on by Dr. Judd, who found an extensive carcinoma of the first portion of the jejunum at the duodenojejunal angle. The growth appeared to be primary in the jejunum. It was inaccessible and could not be removed. Metastasis to the liver could not be made out. Posterior gastro-enterostomy was done to offset any obstruction that might occur. The post-operative course was uneventful until the evening of the fifth day (January 21st), when sudden shock appeared. The abdomen was found to be rigid, and perforation of the lesion into the general peritoneal cavity was suspected. The patient's condition rapidly became worse and he died on the sixth day after operation.

Findings at necropsy.—On opening the abdomen the omentum was found to be extensively adherent to the incision and to the anterior abdominal wall, and about 500 c.c. of thick purulent fluid was found in the peritoneal cavity. The intestinal coils were covered with a dense fibrinous exudate. There was no fluid in either pleural cavity. The heart and lungs were essentially

normal, except for healed tuberculosis of the hilar nodes. The spleen weighed 251 g., with normal lobulations; there was no perisplenitis; consistency was decreased, grade 3. The liver weighed 1,745 g.; its surface was smooth and glistening, but its consistency was decreased. The gallbladder contained 30 c.c. of dark green bile and no stones; the mucosa and wall were normal, and the bile ducts were patent. The œsophagus appeared normal. The stomach contained 100 c.c. of mucus and fluid and was moderately dilated; the rugæ were flattened, and the mucosa was atrophic. Six centimetres orad from the pylorus, the jejunum was loosely attached to the gastro-enteric stoma. The gastro-enteric stoma was ruptured for a distance of 5 cm. at the suture line, but there was no abscess corresponding to this rupture and there was no relation between this rupture and the abscess to be mentioned subsequently. The duodenum was normal. Approximately 15 cm. from the pylorus, at the duodeno-jejunal junction, there was a neoplastic mass on the posterior wall of the jejunum, opening on to the head of the pancreas, in which region there was a perforation which communicated with an abscess cavity on the top of the pancreas. This abscess contained about 75 c.c. of dark-reddish necrotic material and communicated directly with the peritoneal cavity. The ileum, colon, and rectum appeared to be normal, except for the acute peritonitis previously mentioned. The pancreas was estimated to weigh 60 g. and was markedly distorted by the abscess. The suprarenal glands were normal, except for post-mortem autolysis. There were no other important findings except moderate aortic sclerosis.

Microscopic findings.—Multiple sections taken at the site of the perforating tumour revealed a very malignant adenocarcinoma which was infected, and invading the surrounding tissue to a marked degree. It appeared definitely to be of jejunal origin, and in many regions massive and focal necrosis was noted. Sections of mesenteric lymph nodes in the vicinity did not show metastasis.

COMMENT

The outstanding clinical features in this case were marked weakness, severe anæmia, and cramp-like abdominal pains, symptoms which came to the patient's attention in the order mentioned. The weakness was sufficient to prevent his working, and the anæmia was sufficiently grave to have been mistaken for and treated as pernicious anæmia before he came to the clinic. No symptoms were present which would have directed attention to the gastro-intestinal tract until the abdominal pain appeared some months later. At the time of our examination pain was the chief complaint; its constant and striking relation to the taking of cold liquids directed attention to the gastro-intestinal tract. The situation of this pain indicated a lesion in the small bowel, probably in the jejunum. Roentgenological examination was of great assistance at this point, not only in eliminating from consideration the stomach and colon but in very definitely pointing out a lesion in the distal portion of the duodenum or proximal portion of the jejunum.

Primary disease of the jejunum alone and without involvement of other portions of the gastro-intestinal tract is, as has been stated, rare. The commonest localized disease of the small bowel is undoubtedly inflammatory, so-called "regional enteritis". In a recent study of 18 patients with this condition, Brown, Bergen, and Weber³ found that the jejunum was involved in only 3 cases, most of the lesions being in the terminal portion of the ileum. In this case numerous cultures of the stools and of the duodenal contents were made without organisms being found. Ulcer or inflammatory disease in a Meckel's diverticulum was considered and could not be excluded with complete certainty. The situation of the pain and the short interval between the taking of cold fluids and the appearance of pain suggested a lesion higher in the bowel. Extrinsic lesions of the region had to be considered, among which were retroperitoneal sarcoma, invasive carcinoma from the pancreas, and carcinomatous lymph nodes. The roentgenologists' opinion that the lesion was ulcerative within the intestine seemed to exclude an extrinsic lesion.

The problem of anæmia in disease of the small bowel is an interesting one. Lesions (of the small bowel) which interfere with the absorptive function may be accompanied by anæmia, usually of one or two general types: (1) macrocytic (hyperchromic) anæmia, which is due presumably to failure of the diseased intestinal wall to allow sufficient absorption of the specific hæmatopoietic substance postulated by Castle and his co-workers;³ and (2) hypochromic (microcytic) anæmia, which may result from interference with nutrition in general, with poor absorption of iron in particular. Combinations of these, such as macrocytic hypochromic anæmias, are occasionally found. It is probably true that upper intestinal lesions of any type produce anæmia by deficient absorption rather than by loss of blood. If the lesion in the bowel is accompanied by hæmorrhage, however, it is evident that anæmia will increase and the morphological appearance of the erythrocytes will show some significant change. In our case the anæmia was moderately severe and of the macrocytic hypochromic type. It is not at all unlikely that as the disease progressed the hæmatological findings changed. The diagnosis of pernicious anæmia which was made elsewhere, therefore, might well have been con-

sistent with the findings at the time, macrocytosis of the erythrocytes being present early in the disease owing to insufficient absorption of the specific hæmatopoietic principle. As the disease progressed and the absorptive deficiencies increased, the appearance of the factor of chronic loss of blood altered the hæmatological picture.

SUMMARY

A case of primary carcinoma of the jejunum, with the findings on general examination, at operation and at necropsy, is reported, and brief reference is made to the pathology, symptomatology, prognosis, and treatment of primary carcinoma of the small bowel.

REFERENCES

1. D'ALLAINES, F.: Sur l'épithélioma primitif du jéjuno-iléon, *J. de chir.*, 1929, 33: 449.
2. BROWN, P. W., BARGEN, J. A. AND WEBER, H. M.: Chronic inflammatory lesions of the small intestine (regional enteritis), *Am. J. Digest. Dis. & Nutrition*, 1934, 1: 426.
3. CASTLE, W. B., TOWNSEND, W. C. AND HEATH, C. W.: Observations on the etiologic relationship of achylia gastrica to pernicious anemia. III. The nature of the reaction between normal human gastric juice and beef muscle leading to clinical improvement and increased blood formation similar to the effect of liver feeding, *Am. J. M. Sc.*, 1930, 120: 305.
4. CRAIG, W. MCK.: Lymph glands in carcinoma of the small intestines. A review of the condition of the glands in carcinoma of the gastro-intestinal tract, *Surg., Gyn. & Obst.*, 1924, 38: 479.
5. EWING, J.: Neoplastic diseases, 2nd ed., Saunders, Phila., 1922, p. 661.
6. JUDD, E. S.: Carcinoma of the small intestine, *J. Lancet*, 1919, 39: 159.
7. KIEFER, E. D.: Tumours of the small intestine, with a few remarks concerning the surgical treatment of small intestinal tumours, *New England J. Med.*, 1933, 203: 1042.
8. PORZELT, W.: Beitrag zur Klinik des Jejunumkrebses, *Deutsch. Ztschr. f. Chir.*, 1932, 238: 115.
9. RANKIN, F. W. AND MAYO, C. W.: Carcinoma of the small bowel, *Surg., Gyn. & Obst.*, 1930, 50: 939.
10. SOWLES, H. K.: Carcinoma of the small intestine, *New England J. Med.*, 1934, 210: 942.

THE SEX HORMONES AND THEIR VALUE AS THERAPEUTIC AGENTS*

BY MELVILLE C. WATSON, M.B.,

Toronto

IN discussing the value of hormone therapy in the practice of obstetrics and gynæcology it is well to remember that hitherto this field of practice has been limited to the problems related to the generative organs. The field remains limited, but owing to the recent advances in the biochemistry and physiology of the sex hormones the problems now include a consideration of the whole endocrine system in the female.

DEFINITION OF HORMONES

In the present day nomenclature the word "hormone" has largely replaced the more descriptive term "internal secretion". Hormones, then, may be defined as the specific secretions of certain organs, which are usually made up of glandular elements, that are secreted directly into the blood or lymphatic systems. Such products are not limited to the ductless glands, because the pancreas and testis, although possessing a duct system, also secrete hormones apart from the secretions liberated in the ducts. Taken literally, hormone means something which incites. This meaning should refer to action only, which may be either inhibition or stimulation. It now appears quite possible that one hormone may

stimulate activity in some tissue cells and inhibit the action or the production of other hormones.

THE FEMALE SEX HORMONES

The female hormones are primarily concerned with an adaptation of the reproductive organs to a specialization that has taken place in the body. In certain invertebrates the characteristic and only function of the ovary is that of egg production. There is no necessity for hormone action. In certain species of lower vertebrates the egg cells escape through the wall of the ovary to the outside, but as specialization progresses oviducts are developed to make sure that such an exit is possible. It is in connection with the development and function of such passages that hormone secretion is necessary. The active principle of the œstrogenic substances is the hormone that is primarily concerned with the development and the function of these passages. This active principle is called "œstrin" in the present discussion, and the term is used to include all substances possessing œstrogenic activity.

The liberation of egg cells in primitive species is accomplished quite regardless of timed cycles. As specialization advances, internal insemination becomes an additional requirement in the sexual

* From the Department of Obstetrics and Gynæcology, University of Toronto, Toronto.

life of the organism. The reproductive passages are prepared for this act. The hormone "œstrin" controls the preparation of the passages, and it is therefore natural that the seat of hormone production is associated with the mechanism of egg production in order that the time of ovulation or egg release coincides with the proper preparation of the passages. The ovarian follicular mechanism is the site of œstrin production and egg release in the higher vertebrate forms, including the human being.

œstrin alone appears to fulfil the hormonal obligations up to the stage where the embedding and subsequent nourishment of the developing embryo becomes a part of the function of the reproductive tract.

The action of œstrin may be summarized briefly at this point of the discussion. œstrin stimulates the growth of smooth muscle, stratified epithelium, submucosal tissue and undifferentiated cylindrical epithelium, where such tissues are found in the Fallopian tubes, uterus, vagina, and breast. It appears to have a selectivity for these tissues in all mammals. In addition it is responsible in the human being for the appearance of the non-essential secondary characteristics, such as the distribution of the hair, the feminine demeanour, the skeletal changes which contribute to the feminine appearance and have to do with the mechanism of parturition.

A second hormone is produced by the ovarian follicle when it progresses to the stage known as the corpus luteum. This hormone is necessary for the embedding and nourishment of the fertilized ovum during the first stages of development. It is produced by the corpus luteum and is called "progesterone". Secretion of progesterone begins with the first appearance of the lutein change in the follicle at a time when the ovum has already been released and the conditions for fertilization are optimum. Progesterone is concerned with the differentiative phase in the endometrium, a change which cannot be accomplished unless the endometrium has been previously developed by the action of œstrin.

It is not surprising, in view of the demands made on certain metabolic processes in the body by the developing fetus, that other endocrine systems in charge of such metabolic processes should be prepared for these requirements. The anterior pituitary gland has become the central

controlling signal station for such a purpose. The anterior pituitary has assumed a cooperative control of the ovary through a balance between concentration of the ovarian hormones œstrin and progesterone, and the concentration of its own ovary-stimulating hormone, "gonadotropin", in the blood. A similar cooperative control is probably exercised in the case of the thyroid, the parathyroid, the adrenal, and the pancreas. In connection with the ovary, the balance of this cooperative control by the pituitary is a fine one, and appears to be concerned with the synchronizing of the whole endocrine system for the event of fertilization and the subsequent requirements of a developing fetus.

THE MENSTRUAL CYCLE

The anterior pituitary stimulates the ovary by the production of the hormone gonadotropin. The ovary when so stimulated produces, by the action of its follicular apparatus, œstrin, which controls the proliferative phase of endometrial development. When the proliferative phase is almost complete the ovarian follicle normally changes to the corpus luteum body after ovulation occurs. The corpus luteum is formed by gonadotropic influence from the anterior pituitary and produces progesterone, which in turn develops the differentiative phase in the endometrium. The differentiative phase is only concerned with the embedding and nutrition of the fertilized ovum.

As the concentration of œstrin in the body rises the power of the anterior pituitary to stimulate follicular development and œstrin production is diminished. It is suggested that the rise in œstrin concentration is in a way responsible for the change from follicle-stimulating to luteinizing power which is characteristic of the anterior pituitary hormone gonadotropin. In any case, the production of œstrin is diminished during the last few days of the cycle, when the endometrium is under the greatest influence of progesterone. With the physiological involution of the corpus luteum, in the absence of a pregnancy, resulting in the cessation of progesterone secretion and the withdrawal of its inhibitory effect on menstruation, the endometrium disintegrates and bleeding follows. The anterior pituitary regains its follicular stimulating ability in the presence of the lowered œstrin concentration at the time of menstruation, in-

initiates new follicular development, and the cycle is repeated.

In considering the essential features of the cyclic changes which occur in the endometrium under the influence of œstrin and progesterone, one must keep in mind two important facts. First: œstrin is the more primitive of the two hormones, and, therefore, in the lower forms of life it controlled the reproductive tract in its entirety before specialization for the purpose of retention of the developing embryo took place; second, it is not unnatural, therefore, to find that œstrin is still responsible for initiating the development of the endometrium and that pure crystalline progesterone will not give its characteristic differentiative reaction in the absence of a well developed proliferative phase in the endometrium. Briefly, the proliferative phase produced by œstrin is characterized by mitosis, active cell division, resurfacing of the endometrium, and the formation of new straight tubular glands from the surface epithelium. The cells in the epithelium during this phase are of a moderately low columnar type, with the nucleus near the centre of the cell. By the end of the second week the endometrium is, grossly, about two mm. thick. In the absence of progesterone effect differentiation does not take place. The differentiative phase is characterized microscopically by a change to the high columnar type of epithelium, with the nuclei near the base of the cells, and a marked twisting of the form of the endometrial glands as a whole. These changes are due to a very definite cytoplasmic increase in the cell with a decrease in the nucleo-cytoplasmic ratio. In these tall cells there is an increased concentration of glycogenic material, which becomes a constituent of the secretion of the endometrial glands. The resulting secretion is undoubtedly concerned with the protection and early nourishment of the fertilized ovum.

If fertilization occurs events have a natural sequence. The corpus luteum and the progesterone influence is maintained by the appearance of a new substance or a quantitative change in the gonadotropic hormone. In either case the fertilized ovum is considered to be responsible for the presence of this anterior-pituitary-like substance in greater concentration during the early months of pregnancy. It is called anterior-pituitary-like substance

(A.P.L.) because it produces changes in the ovaries of intact immature experimental animals which are similar to those produced by gonadotropin from the anterior pituitary.

THE SOURCES OF ŒSTRIN

In so far as the œstrin regulation of the menstrual cycle and the control exercised over the development of the secondary sex characteristics in the human being is concerned, the production of the required hormone depends upon the follicular apparatus of the ovary. The recent discovery of large amounts of œstrin in the urine of male animals, together with the fact that tissue from stallions' testicles has proved to be richer in œstrin than any other tissue examined (B. Zondek), proves that the substance is not peculiar to the female sex. It is also extensively produced in plants. During pregnancy, in both the human subject and the mare, it is excreted in the urine in large quantities, particularly during the later months. The urine of pregnant women and pregnant mares has been largely used as a commercial source of the hormone.

THE ŒSTROGENIC COMPOUNDS

The nomenclature of compounds showing œstrogenic activity has been complicated by the adoption of a variety of names by individual biochemists and pharmaceutical houses. "Œstrin" is a term which is used in this discussion to include all the compounds showing a degree of œstrogenic activity in the experimental animal. Some of these compounds are enumerated here: (1) Œstrone or ketohydroxyœstrin (theelin, œstroform, amniotin); (2) Œstriol or trihydroxyœstrin (theelol); (3) Œstradiol or dihydroœstin; (4) Benzoate of œstradiol (œstroform "B", Progynon "B"); (5) Emmenin—a placental extract containing œstriol in a combined form (Ayerst).

Considerable confusion exists regarding the effective dose of these substances, owing to a variation in their potency. It should be properly understood that a biological effect produced by any one of them and represented in biological units is the same. That is, a 100 biological unit effect produced in an animal is the same whether produced by action of œstrone, œstriol, œstradiol, benzoate of œstra-

diol, or emmenin. There is a marked difference, however, in the quantity of each substance necessary to produce this 100 unit effect.

In the experimental animal œstrone is more effective when administered hypodermically than is œstriol. Œstrone is considered to be the parent substance and its potency has been arbitrarily given the value of 10,000 international units per mg.*

Œstradiol has a greater potency, but has not been prepared for clinical use. The variation in potency between one mg. of œstrone and one mg. of the benzoate of œstradiol is not so great, but it has been claimed that the physiological effect of the benzoate of œstradiol is more prolonged. It has been observed in the experimental animal that excretion of the benzoate of œstradiol is more protracted and that œstrus effect is more prolonged (Butenandt). Consequently, this substance is given a higher rating than œstrone in biological units for the same weight of substance. The difference in the physiological effect of œstrogenic compounds in the human being is difficult to determine with any degree of accuracy. Emmenin is claimed to be active by mouth, and therefore cannot well be compared with the other substances which produce their optimum effect when administered hypodermically. Œstrone and œstriol and the benzoate of œstradiol are produced in the pure crystalline state and are prepared in solution for hypodermic administration. There are also preparations of these crystalline substances which are recommended for administration by mouth.

The indications for the administration of any one of the œstrogenic compounds are by no means well defined. The action of œstrin in the human being is concerned chiefly with the cyclic change in the reproductive passages during the menstrual cycle, and with certain changes in growth processes before and after

puberty which are continuous over a long period of time. In the first instance there are evidences of a cyclic rise and fall in œstrin concentration in the body with no apparent effort to store the hormones. In the second instance there is evidence of a fairly continuous concentration of œstrin in the body to favour growth processes which are continuous. It becomes apparent, then, that in the absence of any œstrin production in the body a huge dose at long intervals will not supplant smaller daily doses, and for satisfactory effects a fairly continuous concentration must be maintained. Large doses of œstrin represented in international units by a range between 10,000 and 100,000, and in weight of crystalline substance by doses of over one mg. may be considered to have an inhibiting effect on the anterior pituitary. Theoretically, this results in a decrease in the production of gonadotropin, and so an enforced rest in the ovarian activity as well as an increase in stimulation of the reproductive passages by a direct effect on those structures.

Therefore in our work an effort is made to increase the continuous concentration by administration of substances reputed to be active by mouth in all cases in which deficient production of œstrin is suspected. Satisfactory results have been reported by the author in a series of cases suffering from dysmenorrhœa in which a degree of under-development was thought to be a contributing factor. These results have been confirmed by observations which are still in progress. In some cases of irregular menstruation with short periods of amenorrhœa, a regular cycle has been maintained, and symptoms occurring in the menopause have been relieved following continuous administration of daily doses of emmenin. This preparation is used as a supplemental hormone in cases of this type and is administered in doses of 50 to 100 oral day units daily.

Following the hypodermic administration of larger doses (10,000 units and over) of the crystalline substances, uterine bleeding has been observed in cases of amenorrhœa of long standing. By similar treatment in certain cases of atrophic vulvitis and vaginitis the symptoms have been relieved and the epithelium of those regions has been returned to a healthy state. Such results in our work have so far proved to

* It should be clearly understood that this arbitrary international unit is based solely on a definite weight of fine crystalline œstrone. There is no definite relationship between the international unit and the biological unit, since the latter may vary greatly according to the method of assay. It is proposed to adopt a second international unit in the very near future for benzoylated hormone preparations, based on a definite weight of œstradiol benzoate. This second international unit again will have no definite relationship to the biological unit as determined by animal tests. It should, further, be clearly understood that no biological equivalence of the two international units will be implied.

be temporary, with the exception of two cases of atrophic vulvitis.

The consideration of sex hormone therapy in cases of total amenorrhœa or amenorrhœa of the secondary type is involved with other problems in gynaecology and general medicine. Endometrial development may be arrested at any stage in the proliferative or differentiative phase due to malnutrition or hormonal disorder, and so result in amenorrhœa. Microscopic examination of a section of endometrium is a convenient method of determining the degree of œstrin or progesterone concentration. A persistent proliferative phase indicates a maintained œstrin effect, while a persistent differentiative phase indicates the presence of progesterone. We are at present actively carrying on an investigation of the conditions which give rise to the symptom of amenorrhœa and a complete discussion is therefore reserved for a more comprehensive report.

PROGESTERONE

Progesterone is now available in a pure crystalline form, and it is active in the human being when administered hypodermically. It has already been pointed out that the action of progesterone is to produce the differentiative phase in the endometrium preparatory to the normal nidation of the fertilized ovum. Reynolds and others have observed that it inhibits uterine contractions in the uteri of experimental animals, a finding which also appears to be concerned with the retention and embedding of the fertilized ovum. Engle *et al.* have observed that the administration of progesterone to female monkeys will delay uterine bleeding as long as the treatment is continued. From these conclusions, progesterone appears to have two fields of usefulness as a therapeutic agent. First, if progesterone will consistently inhibit uterine contractions in the human uterus it should be useful in relieving dysmenorrhœa. Secondly, if it shows a constant activity in delaying the menstrual flow, it should be of value in the treatment of the conditions which cause short intermenstrual intervals. The difficulty is in regulating the dose so that the contractions will be inhibited without upsetting a normal cycle. From my experience it is very obvious that further clinical investigation on the problem

of progesterone action is necessary before any general statements can be made in this regard.

THE ANTERIOR-PITUITARY-LIKE SUBSTANCE (A.P.L.)

A.P.L. is regarded as a very potent ovary-stimulating substance in the intact laboratory animal. This action has not been observed in the hypophysectomized animal in an obvious degree. Neither is there conclusive evidence to show that it stimulates ovarian activity in the human being. It is excreted in the urine soon after the ovum is fertilized, and it reaches its maximum concentration about the second or third month of pregnancy. The chemical nature of this substance is unknown. A.P.L. has been administered with the hope of preventing habitual abortion. It is very doubtful that a small dose given hypodermically would prevent such a major catastrophe when large amounts are being continuously excreted.

Campbell, Henderson and others have reported favourable results in the treatment of functional uterine hæmorrhage from the administration of A.P.L. These workers have made it clear that an accurate diagnosis is essential before any form of treatment is instituted for the relief of functional uterine bleeding.

SUMMARY

The discovery of œstrone, œstriol, and progesterone, in pure crystalline forms, and the isolation of the ovary-stimulating hormone gonadotropin from the anterior-pituitary gland have simplified our understanding of the physiology of the reproductive organs. In this discussion an effort has been made to acquaint the reader with the principles which govern the normal function of the reproductive system. The relation between the anterior pituitary and the ovaries in the human being, as outlined, is a theoretical one based upon the results of investigations carried out on the experimental animal by workers in this field. The action of œstrin and progesterone on the endometrium as described is supported by observations made during clinical studies in our own clinic and by reports in the literature from other centres.

It is not possible to generalize regarding the indications for the use of the sex hormones as therapeutic agents. Every patient presenting symptoms of abnormal function in the repro-

ductive system must have her symptoms thoroughly investigated and they must be treated individually. These patients must be trained to submit themselves to a thorough investigation and to assist the clinician by keeping thoroughly accurate records of their symptoms over a long period of time.

Acute excessive hæmorrhage and malignant tumours are the only conditions in the reproductive tract which demand the institution of immediate surgical x-ray or radium treatment. Therefore verbal statements concerning the existence of menstrual pain, irregularity, or excessive uterine bleeding should not be accepted as a basis for a heroic form of therapy. Otherwise cures will frequently be effected where maladies did not exist.

Sex hormone therapy is useless and contraindicated if the patient is not well nourished and in good general health. Active preparations of œstrogenic substances are frequently discredited by the fact that they have been administered to patients suffering from malnutrition or anæmia.

In view of the fact that a continuous low dosage of œstrogenic substance is desirable in most of the clinical conditions encountered, *i.e.*, underdevelopment of the reproductive tract, dysmenorrhœa, the symptoms of the late menopause, and some cases of sterility, a preparation which shows œstrogenic activity when administered orally is highly desirable. Preparations of the crystalline substances œstrone, œstriol, or the benzoate of œstradiol, having a known potency of 10,000 to 100,000 units when administered hypodermically, are valuable in the treatment of certain types of amenorrhœa and some atrophic conditions in the reproductive tract. It is my opinion that repeated doses of the œstrogenic compounds having a known potency of 100,000 units, large doses of progesterone or of gonadotropin, should not be recommended for treatment of conditions during the reproductive period without some qualification.

The author wishes to acknowledge his great indebtedness to Prof. W. A. Scott for continuing, as Director, to place the large amount of material at the Toronto General Hospital Gynæcological Clinic at his disposal; to Prof. W. B. Hendry, until recently head of the De-

partment of Obstetrics and Gynæcology, who made the observations possible, and continued as a constant guide and interested director for over two years; and to Prof. G. F. Marrian for invaluable assistance and advice with the problems of chemistry and the supply of œstrone, œstriol, and progesterone.

We are exceedingly grateful to the following firms and institutions for supplies of:—

A.P.L.—liberally supplied by Ayerst, McKenna & Harrison Ltd.

Emmenin—liberally supplied by Ayerst, McKenna & Harrison Ltd.

œstrone—in part supplied from The Biochemical Laboratory, University of Toronto—as “œstroform”, from The British Drug Houses Ltd.

œstriol—from the Biochemical Laboratory, University of Toronto.

œstradiol Benzoate—from The British Drug Houses Ltd.; from The Schering Corporation.

Progesterone—in part from The Biochemical Laboratory, University of Toronto, assayed and ampouled by the Connaught Laboratories; in part by the British Drug Houses Ltd.

The author wishes to express his thanks to the Banting Research Foundation for a grant.

BIBLIOGRAPHY

1. ALLEN, E. AND DIDDLE, A. W.: Ovarian follicular hormone effects on the ovaries, *Am. J. Obst. & Gyn.*, 1935, 29: 83.
2. ALLEN, W. M. AND REYNOLDS, S. M. R.: The physiology of the corpus luteum, *Am. J. Obst. & Gyn.*, 1935, 30: 309.
3. CAMPBELL, A. D. AND COLLIP, J. B.: On the clinical use of ovary-stimulating hormone of placenta; preliminary report, *Canad. M. Ass. J.*, 1930, 22: 219.
4. CAMPBELL, A. D. AND COLLIP, J. B.: Notes on the clinical use of certain placental extracts, *Canad. M. Ass. J.*, 1930, 23: 633.
5. CAMPBELL, A. D. AND COLLIP, J. B.: Further clinical studies on the anterior-pituitary-like hormone of the human placenta, *Canad. M. Ass. J.*, 1931, 25: 9.
6. COHEN, S. L., MARRIAN, G. F. AND WATSON, M. C.: Observation on œstrin excretion during pregnancy, *The Lancet*, 1935, 1: 674.
7. COLLIP, J. B., BROWNE, J. S. L. AND THOMSON, D. L.: The chemical nature of emmenin, *Endocrinology*, 1934, 18: 71.
8. DAVID, K., FREUD, J. AND DEJONGH, S. E.: Conditions of hypertrophy of seminal vesicles in rats. 2. The effect of derivatives of œstrone (menformon), *Biochem. J.*, 1934, 28: 1360.
9. FEVOLD, H. L., HISAW, F. L. AND LEONARD, S. L.: Gonad-stimulating and luteinizing hormones of the anterior lobe of hypophysis, *Am. J. Physiol.*, 1931, 97: 291.
10. HERRELL, W. E. AND BRODERS, A. C.: Histological studies of the endometrium during the various phases of the menstrual cycle, *Surg., Gyn. & Obst.*, 1935, 61: 751.
11. HENDERSON, D. N.: The treatment of menorrhagia and metrorrhagia by anterior-pituitary-like hormone, *Canad. M. Ass. J.*, 1935, 32: 615.
12. HISAW, F. L.: The physiology of menstruation in macacus rhesus monkeys, *Am. J. Obst. & Gyn.*, 1935, 29: 638.
13. MEYER, R. K., LEONARD, S. L., HISAW, F. L. AND MARTIN, S. J.: The influence of œstrin on the gonad-stimulating complex of the anterior pituitary of castrated male and female rats, *Endocrinology*, 1932, 16: 655.
14. MOORE, O. R.: Hormones in relation to reproduction, *Am. J. Obst. & Gyn.*, 1935, 29: 1.
15. MORGAN, T. N.: Studies on the movement of the uterus. 2. The action of extract of corpus luteum on the uterus of the unanesthetized rabbit, *J. Obst. & Gyn. Brit. Emp.*, 1935, 42: 79.
16. MORGAN, T. N.: Studies on the movement of the uterus. 3. The action of gonadotropic extracts on the movements of the uterus of the unanesthetized rabbit, *J. Obst. & Gyn. Brit. Emp.*, 1935, 42: 84.
17. NOVAK, E. AND REYNOLDS, S. R. M.: The cause of primary dysmenorrhœa, with special reference to hormonal factors, *J. Am. M. Ass.*, 1932, 99: 1466.
18. NOVAK, E.: Treatment of primary dysmenorrhœa, with especial reference to organotherapy, *Am. J. M. Sc.*, 1933, 185: 237.
19. WATSON, M. C.: Observations on the treatment of dysmenorrhœa with the placental extract “emmenin”, *Canad. M. Ass. J.*, 1935, 32: 609.

THE PROLONGED TOXIC EFFECTS OF LOCAL ANÆSTHETICS—COCAINE, NOVOCAINE, AND ALLIED DRUGS: UNTOWARD EFFECTS OF NEMBUTAL

By F. H. WETMORE, M.D., C.M.;

Hampton, N.B.

THE literature to which I have had access shows that those who are particularly sensitive to local anæsthetics suffer from one or more of the following conditions, namely, general ill health, low blood pressure, anæmia, defective kidney or liver function, nervousness, allergy, or idiosyncrasy. The toxic manifestations under review may be classified as: (1) cardio-vascular—depression of the circulation due to vaso-motor dilatation—vomiting, faintness, pallor, perspiration, weak pulse, irregular heart action, headache, cyanosis, lowered blood pressure; (2) respiratory—sudden air hunger, pneumonia, acute pulmonary œdema; (3) nervous—extreme nervousness, spasms or tremors, convulsions (usually in fatal cases), paræsthesias. The whole nervous system, including the sympathetic, may be affected.

There may be a long continued condition of ill health, due to delayed poisonous action of the drug injected or simply applied to mucous membranes. The danger is greater after several doses, even months apart, each dose rendering the individual more sensitive to the drug. It is to this presumed action of the drug that I wish particularly to draw attention.

The following cases are suggestive.

CASE 1

This was a maiden lady, an experienced nurse and housekeeper, over fifty years of age, with lessened renal function, rather nervous, and unable to stand hard work. In 1926 there were attacks of hydronephrosis, and in 1927 the left kidney was removed for pyonephrosis, the patient being very ill before and after the operation. In 1930 and again in 1931 I attended her shortly after the extraction of teeth under local anesthesia, the drug being simply rubbed on the gums on the second occasion. The symptoms were the same each time—pain in the mid-dorsal region, and pain and numbness down the right arm. I could not determine the cause; I feared tuberculosis of the spine. With rest in bed she gradually improved.

On October 10, 1934, this patient had two lower left teeth extracted under "Novol" injections (a minimal dose of procaine and epinephrin). On October 11th she did not feel very well. On October 12th, 13th and 14th, she got gradually worse, being chilly, having profuse perspirations, requiring frequent baths and a complete change of clothing, and suffering from headache and neuralgic pains in the back. The temperature on the 14th was 102.6°. On the morning of October 15th, I

found her very ill, of an ashy colour, with a weak pulse, and cyanosis of the lips, nauseated and attempting to vomit, with symptoms of air hunger, and complaining of faintness at times and a feeling in the chest as if the heart were trembling and would stop beating.

On October 16th, the patient complained much of pain in the left side of her face and neck and between her shoulders, with pain and numbness that had gradually gone first down the left arm then the right, to her fingers. The pain had descended in waves, as she expressed it, through her body to her toes. The temperature was normal, the blood pressure 94/54, the urine normal. There was slight jaundice. Mucous râles were present in the chest for a day or two. The heart soon became normal. There was pus in a tooth socket requiring treatment. The pain and numbness, as in 1930 and 1931, remained for a long time. Attacks of trembling were a marked feature. For weeks, merely sitting up in bed, or other exertion, or any emotional excitement would bring on an attack consisting of air hunger, faintness, trembling, and that peculiar sensation in the chest, above mentioned. Even during these attacks, the pulse and heart sounds were not altered. On November 8th the hæmoglobin was 90, and the red and white blood cell count within normal limits. A consultation on this date gave no other satisfactory explanation of her symptoms.

The patient remained in charge of a nurse for seven months. Even yet (October, 1935) hurrying or excitement causes weakness and that peculiar sensation in the heart region.

Neither infection from the tooth socket nor the use of adrenalin would satisfactorily explain the case. With similar symptoms in an individual, male or female, it would be well to keep in mind the possible after-effects of a local anæsthetic, especially if the patient is worse after the extraction of teeth than before the operation.

CASE 2

This was an adult female, who was never very rugged, but whose heart a specialist said was particularly good and whose tissues were healthy. In 1917 she had a dental nerve killed by cocaine pressure. In half an hour she vomited, had intense pain in that side of her face, soon began to perspire freely, and a week later had severe bowel hæmorrhages. Abscesses continued to form around the adjacent teeth, the nerves of which died, evidently as a result of the cocaine. A dentist was in constant attendance. It was two or three months before the tooth first treated could be filled. The temperature, during this time, was subnormal in the mornings (94.6 to 95.6°), high in the mid-afternoon (100.6 to 102.6°), and normal in the evenings. She became exhausted at the first, continued to fail, and remained absolutely no good for months. It was at this time the patient realized that her radial arteries pained and were painful to the touch, a condition which later extended to most of the large arteries of the body and is still present.

In 1919 cocaine was used several times, at weekly intervals, in Eustachian tube manipulations, followed by the same poisonous symptoms as in 1917. The patient was very ill on each occasion, and gradually lost health and strength. Without cocaine the same treatment was not injurious. In June, 1930, percaïne was swabbed on the mucous membrane of the nose, followed on the third day by a rash, and in four and one-half days by the same poisonous symptoms, namely, faint spells, air hunger, tremors, paræsthesias all over the body, and a severe uterine hæmorrhage. Complete exhaustion lasted over a year.

In October, 1931, and again in 1932, a dentist, contrary to advice, touched a tooth cavity and the adjacent gum with a novocaine preparation, followed on each occasion by similar poisonous symptoms. In September, 1935, eight teeth were extracted under general anæsthesia, and although several of the tooth sockets suppurated there were none of the usual symptoms of poisoning—no perspiration, no tremblings, no fainting spells, no air hunger, no numbness, just pain in the face, general weakness, and a slight rise of temperature.

This patient still has a weak heart, tires very easily, and on the least over-exertion has attacks of faintness, air hunger, and pulsations in the arteries, such as she experienced during and after the several doses of local poisoning. The blood pressure varies with the least emotional excitement. The systolic may rise to 160 mm. or more, when normally it is 120 mm. or less. If there is more pain in the arteries of one side of the body than the other, as frequently happens, there is a corresponding rise in the blood pressure, both systolic and diastolic, on that side, of from 10 to 20 mm. She is well nigh a semi-invalid.

The treatment that appeared to be beneficial was absolute rest in bed and quietness for a considerable time, free administration of liquids, and frequent doses of sulphate of magnesia. Soda and lime, as well as magnesia, appeared to be helpful, possibly because they raise the blood pressure. Aromatic spirits of ammonia helped the attacks of air hunger.

Nembutal.—For over twenty years the barbituric acid group of drugs has caused serious toxic symptoms, and has been responsible for many fatalities. R. J. McNeil Love,¹ in an article headed "A warning regarding basal narcotics", said, "Patients exhibit an idiosyncrasy to most drugs and perhaps especially to narcotics. It is possible that for various reasons little is heard about these unpleasant results, and, therefore, basal narcotics are apt to be administered indiscriminately." And Sir William Willecox² in addressing the Royal Society of Medicine in December, 1933, said, "With the

drugs used for basal anæsthesia the need for care in dosage cannot be too strongly emphasized . . . I have been so impressed with their toxic effects that I never prescribe any of the barbituric acid group of drugs." He mentions the type of person liable to be abnormally susceptible—allergic patients with a history of asthma, urticarial attacks, angio-neurotic œdema, etc.; those with defective renal function, having nephritis, chronic cystitis, or latent pyelitis; those with defective liver function, as cirrhosis, a tendency to jaundice or attacks of acidosis; those with hyperthyroidism, myocardial disease or glycosuria; those with sepsis.

Barbiturates cause toxic symptoms by affecting the lungs, producing broncho pneumonia; the kidneys, producing suppression of urine; or the liver, producing coma and death. Sir William Willecox,³ in a recent discussion on the use and abuse of narcotic drugs said, "No drugs could cause pneumonia as much as the barbiturates." Some years ago, when deaths from pneumonia followed an operation, we thought of ether anæsthesia as the cause; now, we wonder if nembutal or other barbiturate was used before operation. It is not only when the drug is used as a basal anæsthetic that there is danger. The above-mentioned authority stated at the Melbourne discussion that he had seen pneumonia following the use of three grains of nembutal. This condition was confirmed by six other medical practitioners.

The writer of this article has seen cases of pneumonia, which he believed were due to the administration of this drug, and himself suffered from pneumonia following the pre-operative use of nembutal.

REFERENCES

1. LOVE, R. J. McN.: A warning regarding basal narcotics, *Brit. M. J.*, 1935, 2: 327.
2. WILCOX, SIR W.: The uses and dangers of hypnotic drugs other than alkaloids, *Brit. M. J.*, 1934, 1: 417, 418.
3. WILCOX, SIR W.: Discussion on the use and abuse of narcotic drugs, *Brit. M. J.*, 1935, 2: 749.

CLINICAL EXPERIENCE WITH PROTAMINE INSULINATE.—H. F. Root, P. White, A. Marble and E. H. Stotz state that preliminary observations in 15 cases have in general confirmed the observations of Hagedorn and his associates regarding the protamine insulinate that has been developed in their laboratories. Presumably by slow breakdown of the compound in the subcutaneous tissues, a blood sugar lowering action is secured which is evened and more prolonged than that which follows regular insulin. Because of this wide fluctuations in blood sugar level are less apt to occur and hypoglycæmic reactions

can be largely avoided. The new preparation is still in the experimental stage. Further work both in insulin laboratories and in diabetic clinics will be necessary to determine when, how, and in which patients protamine insulinate or some related compound can be best used. With the prospect bright of maintaining the level of the blood sugar within normal limits throughout the twenty-four hours, it would appear as if a new revolution in the treatment of diabetes must follow and the possibility created for the diabetic patient to resemble more closely a normal individual.—*J. Am. M. Ass.*, 1936, 106: 180.

EXCESSIVE PERSPIRATION

BY A. HOWARD PIRIE, M.D.,

*Royal Victoria Hospital,**Montreal*

EVER since Adam was told "In the sweat of thy face shalt thou eat bread" (Genesis 3: 19) the human race has perspired under certain conditions. Exertion, heat, excitement and fear are natural producers of perspiration. Certain drugs and foods also produce perspiration. One of my fellow students was very fond of ginger, and we always knew when he had been secretly eating it by seeing drops of perspiration at the root of his nose.

The excessive perspiration which some people suffer from has certain definite characteristics, and when these are present there is no need for them to continue in their unpleasant condition. The person with whom we have all shaken hands, whose hand is so damp that we wish to dry our own immediately is one of those who can easily get rid of his affliction. The man who continually suffers from cold feet because his socks are always wet is another who can be easily cured; but those who can get the greatest relief are the unfortunates who soak their clothing from excessive perspiration in their armpits. A doctor who suffered this way pointed out to me what he called his "high water mark" on his coat; this was a white line of the salts of perspiration deposited at the line where the soaked clothing met the dry clothing. Those who have never seen really distressing perspiration would be surprised to see how abundant it can be. For instance, I have given a lady a towel on which she dried her hands. Keeping her palms up for two and a half minutes the drops of perspiration began to run together, and at the end of five minutes from the time that she dried her hands I have seen the perspiration drop from the tips of her fingers. It is characteristic of this excessive perspiration that it occurs as much in cold weather as in warm. Excitement makes it worse. It goes on all day from the time the patient wakes till he goes to sleep, and it ceases absolutely during

sleep. When the perspiration has a disagreeable smell it is such a handicap that the sufferer has difficulty in finding a situation owing to his, or, especially her, offensiveness to neighbours. This is also a condition easily and permanently cured. When the feet are affected by bromidrosis the smell is even worse, and this also can be stopped permanently.

The condition came first to my notice about 1909 when I gave a patient a prolonged course of x-ray treatment for a tuberculous hip joint. Two years later he told me that he did not perspire where the x-rays had fallen and perspired freely over the rest of his body. I immediately looked for suitable cases of excessive perspiration on whom I could practise the same treatment. However, nearly two years passed before I found four such. Three of these were in doctors, and one in a layman. I told them my theory and laid down a course of treatment, *viz.*, one epilation dose once a month for six months. They all agreed to try it. One of these had the high water mark on his jacket; another had hands like crocodile leather from prolonged use of formalin, full strength, which he had used for years. He found it controlled the perspiration for three days after each application.

These four patients came to me in the beginning of 1911. Each received a treatment once a month, and when the fourth treatment came and no improvement was visible their patience and my enthusiasm suffered, but when the time came for the fifth each came back satisfied that the perspiration was much less. After the sixth treatment every one was quite cured. Since that time I have treated 20 cases for hands, 18 for feet, 18 for axillæ, and 1 for the face. At the end of 1935 I was able to follow up 15 cases and ascertain that every one of them had remained cured. The following Table shows the results after a term of years:—

TABLE I
SHOWING RESULTS OF ONE X-RAY TREATMENT PER
MONTH FOR 6 MONTHS FOR EXCESSIVE
PERSPIRATION

Remain cured after 24 years	1
“ “ “ 12 “	1
“ “ “ 10 “	1
“ “ “ 9 “	1
“ “ “ 7 “	1
“ “ “ 5 “	1
“ “ “ 4 “	2
“ “ “ 3 “	2
“ “ “ 2 “	1
“ “ “ 1 “	4

31 other cases were treated but no follow-up has been obtained of them.

TABLE II
CURED CASES 1911 TO 1934. (SOME NOT FOLLOWED UP)

<i>Hands</i>	<i>Feet</i>	<i>Armpits</i>	<i>Face</i>
18	15	18	1

I have made attempts to shorten the period required by giving larger doses, but had to give this up owing to the discomfort produced. On the other hand, in two cases I have tried to get results by smaller doses given more frequently, and this failed. The more excessive the perspiration, the more sure is the cure. By the word “cure” is meant either a bone-dry result or a condition of normal perspiration. When I began the treatment of the hands I made the mistake of making them too dry, until one patient asked me to put some perspiration back as her hands were too dry! Since then I have stopped the treatment so as to leave them with a trace of moisture and not bone-dry.

CORONARY ARTERY THROMBOSIS WITH TREATMENT BY PROLONGED REST IN BED AND LOW CALORIE DIET; IMPROVED PROGNOSIS.—A. M. Master reports on seventy-five patients in eighty-five attacks of coronary thrombosis treated by immediate complete rest in bed for six weeks and by a regimen of low calorie diet. Eight patients died, only one in a first attack. Meticulous attention to detail is essential to the management of a patient in an attack of acute coronary thrombosis. During the initial stage of shock the patient is given very little food. Low calorie diets and small meals prevent dangerous gastrointestinal cardiac reflexes or mechanical disturbances; they also lower the basal metabolic rate and diminish the work of the heart. The heart is given an opportunity to heal and to form collateral circulation. Morphine and codeine were used liberally for severe pain. Glyceryl trinitrate, amyl nitrite, digitalis and epinephrine were considered dangerous. The prognosis for the first attack of coronary artery thrombosis is considered very

No general bad effects have been reported from stopping this local perspiration; the only possible objectionable local effect is that in some cases slight telangiectasis follows. This however is rare. In treating the axillæ the hair comes out and remains out permanently. In some cases it is thinned out and remains permanently sparse. The danger of producing telangiectasis has made me refuse to treat another case of perspiration on the face after the first which I treated in 1911.

The case of demonstration of the action of x-rays on sweat glands is something which has a bearing on other x-ray treatments. The fact that these glands can be completely destroyed in six months without injuring the skin gives one a hint for the treatment of carcinoma. The gland cells are over-active, just as the carcinoma cells are over-active. It is the over-active cell which is more sensitive to x-rays, but its degree of sensitivity is only slightly greater than that of the surrounding cells. In order to give the exact dose which will kill the over-active cell and leave the normal cell unharmed the best method is to spread the x-ray treatment over a long period, as described for the treatment of excessive perspiration.

The method of treatment is as follows: 90 kilowatt, 8 milliampères, 17 inch distance, no filter, one epilation dose. Using the Mecapion I found this epilation dose is equal to 250R. The treatment is given once a month at intervals of four weeks until six treatments have been given. In treating the hands care is taken to reduce the treatment if necessary so as not to destroy perspiration completely.

good. Usually a patient does not die in his first attack. A hypertension is generally present preceding a subsequent attack. It is probable that in women a coronary thrombosis takes place only when hypertension is present. The prognosis is better in cases in which the blood pressure is not high. The prognosis of patients with infarcts on the anterior or posterior surface of the left ventricle is equally good. Multiple attacks of coronary thrombosis are common. A patient who dies within twenty-four hours presumably has had previous attacks of coronary thrombosis and has probably suffered from marked hypertension. If the patient lives through the first twenty-four hours, he will probably survive that particular attack. Congestive failure is usually absent during the first attack of acute coronary thrombosis. Patients returned to their usual routine life or work following 62.5 per cent of the attacks and resumed light to moderate activity in 14 per cent.—*J. Am. M. Ass.*, 1935, 105: 337.

INDUSTRIAL TUBERCULOSIS IN MONTREAL*

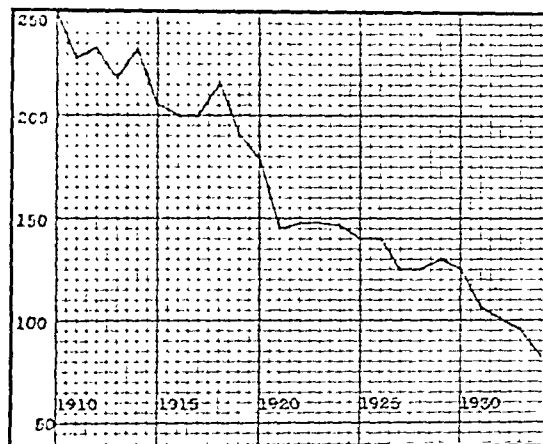
By R. VANCE WARD,

*Department of Public Health and Preventive Medicine, McGill University,
Montreal*

THE systematic periodic health examination of the presumably normal person is, without any question, the activity of an industrial medical service most productive of benefit to the individual. Illustrating the truth of this statement, a committee of physicians in Montreal, representing the Department of Public Health and Preventive Medicine of McGill University, the Canadian Tuberculosis Association, and the Provincial Bureau of Health, undertook in 1931 to conduct a complete physical examination of a large number of industrial employees and college students, including an x-ray of each chest. Since, in the Province of Quebec, tuberculosis is still the outstanding disease to be eradicated by the obvious means of early diagnosis and early treatment, the discovery of early cases of this disease was made the principal object of the survey. The actual examinations were continued over a period of four years. An expert radiologist was included in the personnel, so that the examinations, often repeated in doubtful cases, may be considered adequate.

The present paper deals more particularly with the findings of chronic respiratory disease in the survey, the publication of the other data being reserved for other communications. It must be confessed, with some chagrin, that the Province of Quebec occupies a rather unenviable position on this continent as far as mortality from tuberculosis is concerned. Several reasons account for this. Low wages and large families are the rule, so there is a low per caput income. The population has yet to live down the tradition of sealed windows, a tradition born of centuries of struggle in pioneer days, to keep out the cold of our rigorous Canadian winters. Finally, invigorating and healthful as our climate is for the well-nourished and well-clothed it shows scant mercy to the constitutionally weak, the ill-fed and the poorly clad.

A marked improvement is, nevertheless, evident, as will be indicated by the chart of the death rate from pulmonary tuberculosis for the past twenty-four years in Montreal. The decline in mortality is about parallel to that experienced elsewhere.

TUBERCULOSIS DEATH RATE PER 100,000
POPULATION, MONTREAL

Two factors are of prime importance in any campaign against tuberculosis in a community—early diagnosis and adequate sanatorium care. The first of these is obviously the more important, for, practically speaking, in so far as the community is concerned, without early precautions with regard to sputum it matters little to the unfortunate contacts that the patient is removed, at a later stage of the disease, to a beautiful sanatorium.

The discovery of cases of tuberculosis has been accomplished throughout history in a number of ways. The time-honoured method of the examination of the sick individual in the physician's consulting room is no longer adequate. The next method is the one which forms the basis of our anti-tuberculosis work at the present time, the thorough examination of contacts by the public health body. This has produced wonderful results, yet even this method must give place to the attempt to discover in apparently normal persons early evidence of the disease. In this connection the periodic

* Read at the combined meeting of the Canadian and American Medical Associations, Atlantic City, Section of Preventive and Industrial Medicine and Public Health, June 12, 1935.

health examination promises much, but we must admit that in a majority of cases we cannot discover minimal tuberculous lesions by the ordinary methods of clinical examination of apparently healthy people. Apparently then, the really adequate periodic health examination must include an x-ray of the chest. Obviously we cannot x-ray the chests of the whole population. Thus, for example, the cost per examination in our experience has been as follows: plate 50c; developing 10c; technician 25c; a total of 85c. for each individual. With an incidence of 0.7 per cent of active tuberculosis, this works out to \$121 per case discovered, without including interest or depreciation on the machine.

Our present study is an attempt to find out how we can discover most economically the incipient cases of tuberculosis in our city, in other words, an attempt to answer the following questions: (1) What is the percentage of unrecognized pulmonary tuberculosis in our adult working population? (2) What are the age and sex of these patients? (3) From what racial groups do they come? (4) What manner of people are they—thin, obese, or of average weight? (5) Do many of them give a clear history of contact with tuberculosis? (6) Have they symptoms or signs which should have pointed them out to us without an x-ray examination? (7) With a very limited budget, would we have discovered the greater number of cases by taking an x-ray of the chest of, say, native-born girls, 15 to 25 years of age, who are underweight, or of all those people who had tuberculosis in their families?

The survey included a study of 3,865 persons who fell into the following age and sex groups:

TABLE I

Age	Males		Females	
	Number	Percentage of all males	Number	Percentage of all females
15-19	362	16.1	524	32.5
20-24	367	16.3	597	37.0
25-29	284	12.5	263	16.4
30-34	300	13.3	104	6.6
35-39	270	12.0	59	3.7
40-44	237	10.5	27	1.7
45-49	155	6.9	14	0.8
50-54	135	6.0	15	0.9
55-	128	5.7	5	0.3
Unknown	17	0.7	2	0.1
	2,255	100.0	1,610	100.0

As we might expect from a random selection, the males were fairly evenly distributed throughout the five-year age periods up to age 45; after this age, there is a gradual falling off. Eighty-six per cent of the females were in the age periods 15 to 29. Women of this age are, of course, the only ones conveniently reached through industrial work.

Divided according to place of birth, we have the following percentages:

TABLE II

Place of birth	Male percentage	Female percentage
Province of Quebec	55.5	86.6
Elsewhere in Canada	13.7	4.9
United States	5.0	2.2
British Isles	17.2	4.9
All other places	8.6	1.4
	100.0	100.0

The relationship of weight to age and height for each individual was worked out, and it was found that the whole group fell into the following categories:

TABLE III

	Male percentage	Female percentage
Normal weight	57.5	60.0
10-19 pounds underweight	16.6	21.5
20 or more pounds underweight ..	7.9	9.7
10-19 pounds overweight	7.4	4.7
20 or more pounds overweight ...	10.6	4.1
	100.0	100.0

Sixty-nine (3 per cent) of the men, and fifty (3.1 per cent) of the women gave a definite history of tuberculosis in their families.

ACTIVE AND INACTIVE TUBERCULOSIS

In the entire group, we found 27 cases of active tuberculosis, a percentage incidence of 0.7. Inactive cases numbered 53, or 1.4 per cent. In order that a case should be considered inactive it was necessary that the following conditions be fulfilled: (1) the original x-ray picture must show signs of healing; (2) there must be no physical signs or symptoms; (3) the subject must remain well up to the final writing of this report, May, 1935; (4) subsequent x-rays must show no advance over the original one.

The location of the active lesions is shown in the following Table:

TABLE IV

Right apex	10
Left apex	6
Both apices	10
Extensive bilateral	1
	<hr/> 27

The incidence of the 27 active cases, by age and sex groups, was as follows:

TABLE V

Age	Male		Female	
	No. active cases	Percentage incidence in the age group	No. active cases	Percentage incidence in the age group
15-19	2	0.55	5	0.95
20-24	—	—	8	1.34
25-29	2	0.70	1	0.38
30-34	2	0.66	—	—
35-39	2	0.75	1	1.69
40-44	2	0.84	—	—
45-49	1	0.64	—	—
50-54	1	0.73	—	—
55—	—	—	—	—
	<hr/> 12		<hr/> 15	

Forty-eight per cent of the cases were discovered in the 29 per cent of the individuals who were females, 15 to 24.

Although the numbers are too small to draw any very satisfactory conclusions from them, two points stand out. First, it is apparent that the cases discovered among the males were very evenly distributed throughout all the age groups, and we would have made no saving by examining only one or two groups. Secondly, the percentage incidence among the young women, 15 to 24, was very much higher than that of any other group. In fact, 48 per cent of the active cases were found among this group, which made up only 29 per cent of the whole survey.

Distributed according to birthplace, the active cases fell into the following groups:

TABLE VI

Place of birth	Number	Percentage incidence in the natal group
Province of Quebec	21	0.79
Elsewhere in Canada	3	0.77
United States	1	0.67
British Isles	2	0.43
	<hr/> 27	

The distribution was remarkably even.

Having determined the age, sex, and nativity of our active cases, we were curious to know

whether or not we could have discovered most of the cases more economically by taking into consideration bodily form or the occurrence of physical signs in the chest. The following Table shows the relationship of the active cases to the various height-weight groups and the occurrence of physical signs.

TABLE VII

	No. of cases	Percentage incidence in that group
Normal weight	13	0.57
10-19 pounds underweight	8	1.11
20 or more pounds underweight	6	1.79
10-19 pounds overweight	0	—
20 or more pounds overweight	0	—
	<hr/> 27	

Fifty-two per cent of the cases were found among the 27 per cent of persons who were underweight; none among those ten pounds or more overweight. Eleven persons gave no history or physical signs suggesting tuberculosis. Seven persons gave a history of exposure to tuberculosis, or of some symptom suggesting the disease—pleurisy, frequent colds, cough, expectoration, hæmoptysis, loss of weight, chest pain; nine gave such a history and, in addition, showed physical signs suggestive of tuberculosis.

SUMMARY AND CONCLUSIONS

1. Three thousand eight hundred and sixty-five adults received a complete physical examination, including a chest x-ray.

2. Twenty-seven cases of active tuberculosis were found, an incidence of 0.7 per cent.

3. Fifty-three cases of arrested tuberculosis were found, an incidence of 1.4 per cent.

4. Forty-eight per cent of the active cases were found among the 29 per cent of the total who were females, 15 to 24.

5. Fifty-two per cent of the active cases were found among the 27 per cent of the total who were underweight.

6. Number having no history or physical signs, 11; number having a suggestive history, but no physical signs, 7; number having both a suggestive history and some physical signs, 9; total, 27.

7. A really satisfactory periodic examination should include an x-ray of the chest at least in (a) those persons giving a history suggestive of tuberculosis; (b) young women, 15 to 25; (c) those 10 pounds or more underweight.

THE INCREASED INCIDENCE OF PEPTIC ULCERS AMONG THE SINGLE UNEMPLOYED

BY R. JULIAN BROWN, B.Sc., M.D.,

Jasper, Alta.

[I]t became apparent during the past winter that there was a considerable increase of peptic ulcer among the unemployed under the author's care. The author has had charge of the medical work in two unemployed single men's relief camps for the past twenty months and during that time accurate records have been kept, and the increase was quite alarming during the winter months from September, 1934, to March, 1935, inclusive. It must be pointed out, however, that all the cases observed were in a limited number of men, drawn largely from the Edmonton area, and that the findings may not be applicable to all unemployed single men.

All these men have been on relief for periods ranging from less than a year to almost four years, and have been taken care of for various periods of time in single unemployed relief camps. The vast majority of them have been on the move constantly, very rarely staying in one camp or place for more than three or four months at a time. The majority of the cases were in men of foreign extraction, mainly Ukrainian. Due to this constant change, very few of the cases could be followed to anything like a definite conclusion, for as soon as the acute stage subsided the patient would pack up and move on.

The camps under the author's medical care housed from one hundred and fifty to two hundred men per month during the period mentioned, namely, from September, 1934, to March, 1935. Before September of 1934 there was only the odd case presenting the symptoms of peptic ulcer, but from then until March, 1935, there was a regular procession of them, as the table below will show:

TABLE I

September, 1934	.... 3 cases	.... 1 hospital case
October, 1934	..... 1 case	.... 0 hospital cases
November, 1934	....13 cases	.... 1 hospital case
December, 1934	..... 6 cases	.... 0 hospital cases
January, 1935	..... 6 cases	.... 1 hospital case
February, 1935	..... 6 cases	.... 2 hospital cases
March, 1935	..... 3 cases	.... 1 hospital case
	38 cases	.... 6 hospital cases

Since March, 1935, the author has only had two cases presenting any peptic ulcer symptoms, and these were very mild, clearing up under a short course of treatment.

All the 38 patients, with two exceptions, were heavy eaters while in the camps, and admitted being so for some years previously. We did not know just how they had been living before coming to camp, but without doubt they had been living precariously. This would mean possibly insufficient food and some of it of very doubtful character. When they first arrived at the camps they all ate voraciously, and kept this up for at least the first two weeks, when they settled down to more normal amounts of food. One patient, when put on dietary treatment, went so far as to eat his diet and then turn up at the mess-hall and partake of the regular meals, following which he reported no improvement in his condition. Nearly all the men before coming to camp had been eating at the soup kitchens in the cities, where they were only getting two meals per day. Some of them had been on the soup kitchen diet for some time, others for only a short period, but all had been roaming about the country, living as best they could for considerable periods of time.

All the patients reported a period of gastric discomfort, some for a considerable time (2 years or more), others for a period of a few months. We could not correlate this period of discomfort with the life they had led before they came to us, for the histories were more than difficult to get in some cases. All the patients hospitalized did well under treatment, with one exception and this man had a palpable mass just to the right of the mid-line of the epigastrium. He was considerably relieved by treatment, but was not entirely free of pain after five weeks' hospitalization. All the patients treated in the camps did well, many leaving before the treatment was completed. A detailed table showing the symptomatology of the 38 listed cases is appended.

The food served these men was of good quality and of as great a variety as possible. It was well cooked and served. There was a plentiful supply of vegetables at all times, carrots, beets, cabbage, potatoes, turnips, parsnips and onions. Cooked dried fruit was served at least once each day. Meat was served twice each day, usually hot for the noon meal, and cold or warmed over for the evening meal. The meat consisted of beef, pork, lamb and ham. Desserts consisted of pies, puddings and fruit and cake. Dried peas and beans were also used to supplement the menus. Naturally pickles, sauces, etc., were limited, but did make an occasional appearance. Altogether the food was good and would compare favourably with the menu of any good construction or logging camp, the obvious lack, of course, being fresh foods, such as raw fresh milk, fresh eggs, fresh lettuce, etc. These foods were out of the question, due to the isolated area in which the camps were located.

The treatment given was based on Sippy's method, with modifications suitable to the particular case. The patients with milder manifestations were ambulatory and carried on with their work while undergoing the course of treatment.

These men work six days a week, from eight in the morning until twelve o'clock noon, and from one in the afternoon until five o'clock. Their work is nearly all manual labour; some however are employed around the camp as orderlies and as assistants to the staff. Only 2 of the 38 patients were employed about the camp, all the others were engaged at manual labour. Their living conditions are very comfortable. Each man has his own bed, and their quarters are not crowded. Sanitary conditions in the camps are excellent, for the wash house

is provided with hot and cold showers and the latrines are in sufficient number and are kept scrupulously clean. Games of all kinds are promoted by the staff, to afford amusement and exercise for the personnel.

It is the author's considered opinion that most of this peptic trouble can be traced to two main causes, namely, overeating and the hardships these men have experienced before coming to the camps. It is obvious, from observing them, that before admission to the camps they have been under-fed and that once they arrived they over-eat. They get the same, if not more, exercise than the average citizen, and this does not appear to be a factor. The lack of fresh foods and the question of mental worry, I do not feel play a very large part in the above series, especially in view of the type of men concerned. Privation over various periods of time, and then a period of marked over-indulgence, seem to be the most important factors.

TABLE II
CLINICAL DETAILS OF 38 CASES

Epigastric discomfort	38
Flatus or belching	20
Pain	38
Pain made worse by food	10
Pain improved by food	28
Rigidity of recti	4
Nausea	20
Vomiting	5
Haematemesis	0
Afraid to eat	8
Pain at night	8
Pressure increased pain	10
Tender, right of mid-line	7
Tender in mid-line	16
Tender, left of mid-line	15
History of a previous attack	9
Constipation	30
Complete relief	24
Partial relief	6
Incomplete treatment	8
Palpable mass	1

EXTRAUTERINE PREGNANCY AT TERM.—E. Arndt records four cases of laparotomy for extrauterine pregnancy at, or shortly past, term. In two instances a macerated fetus was removed three months after a false labour. The fetal sac in the first case was detached from a Fallopian tube without difficulty, but in the second it was so intimately applied to the intestines that marsupialization had to be undertaken, with good results. In the other two cases the infant was living at term, but one mother died from hæmorrhage, and the child survived for only one hour. In the remaining case the child is still alive and healthy after four years. The mother, an elderly primipara, was submitted to operation in order to terminate pregnancy for eclampsia, the

abdominal site of gestation not having been diagnosed with certainty. Arndt states that some 330 cases of extrauterine pregnancy at term have been reported. In spite of surgical progress their number has not diminished; after the fifth month diagnosis is very difficult, and in many cases medical aid is not sought until near term. A fetal mortality at term of three in five has been reported. For extrauterine pregnancy in the late months French and Russian obstetricians advise operation at term, but German writers counsel immediate intervention, these contrasting modes of treatment being based respectively on the fetal and maternal interests respectively.—*La Gynéc.*, Aug., 1935, p. 481. Abs. in *Brit. M. J.*

THE CHOICE OF TREATMENT IN CARCINOMA OF THE BLADDER*

BY ROBIN PEARSE,

*Department of Urology, Toronto General Hospital,**Toronto*

CANCER of the bladder makes no exception to the general rule that failure to make an early diagnosis loads the scale against the chances for successful treatment. Bleeding and pain are two symptoms which patients rarely neglect. A transient pain with hæmaturia is in the majority of cases the first sign of a bladder tumour, and a medical man neglects his duty if he does not make every effort to arrive at an accurate diagnosis the first time a patient shows blood in the urine. If the patient refuses the necessary examinations or consultations the probabilities should be explained to him and the responsibility placed on his shoulders. Pain is not a symptom of early cancer; it usually means "too late".

While it is encouraging to note each year a greater percentage of patients coming for treatment in the early stage of disease, many present themselves with more or less advanced cancers, and at times with concurrent disabilities such as cardio-renal insufficiency which must be taken into consideration in determining the type of treatment to be used.

The ideal in treatment is a procedure which will achieve a permanent cure with a minimum loss of function, while submitting the patient to the least possible inconvenience in the process. Obviously this ideal is often unattainable.

The primary decision must be whether a cure is to be attempted, or whether treatment is to be directed towards allaying distressing symptoms and delaying as long as possible the progress of the disease. In making this decision the following points must be considered: (1) the type of growth; (2) the number, size and position of the tumours; (3) the degree of infiltration of the bladder wall; (4) has the growth extended through the bladder wall into contiguous structures?; (5) involvement of the internal meatus or ureteral opening and sec-

ondary renal changes; (6) the presence of metastases; (7) the age of the patient and the presence of disease in vital organs, and (8) the expectation of life of the patient considered aside from the cancer.

Three types of cancer may be identified on cystoscopic examination: (a) malignant papilloma; (b) papillary carcinoma, or cauliflower tumour; (c) sessile ulcerating carcinoma.

The malignant papilloma resembles somewhat the so-called benign papilloma, but the tendrils and pedicle are shorter and thicker. Sections examined under the microscope show but little invasion through the basement membrane by cancer cells. The growth does not extend through the submucosa. This type of tumour is of low-grade malignancy and metastases are rare. Nevertheless the tendency to recur locally and to form multiple seed tumours in the bladder renders an efficient follow-up system and co-operation by the patient essential for successful treatment.

When a patient has a malignant papilloma not more than two cm. in diameter or has not more than three or four smaller ones, bipolar diathermy through the cystoscope provides the ideal in treatment. In my opinion it is better to give the patient gas and oxygen and destroy the tumour with its pedicle and the bladder wall in the immediate vicinity down to the submucosa with a large electrode at one operation than to submit him to two or three treatments under local anaesthesia. One month after treatment the bladder should be re-examined, and if there is any doubt that the tumour is eradicated radon seeds should be inserted. The patient then reports in three months and, if free from recurrence, every 6 months for three years, and then each year until the tenth year, if he can be so persuaded. When patients report at regular intervals, irrespective of the lack of symptoms, small recurrent and seed tumours are found and may be destroyed at the time of examination without fuss or loss of further time. In my

* Read at the combined meeting of the Canadian and American Medical Associations, Atlantic City, Section of Urology, June 14, 1935.

experience 80 per cent are cured or under control after five to ten years' observation and 2 per cent developed an infiltrating tumour; 18 per cent were lost sight of in the first three years.

Malignant papilloma or those growths too large or numerous for treatment through the cystoscope should be treated by suprapubic cystotomy and diathermy. The patient should void before coming to the operating room. Spinal anaesthesia is used to ensure complete relaxation; the bladder is opened and any urine present aspirated without touching the tumour or spilling the urine into the wound. Protecting towels are attached by Michel clips to the edge of the bladder, a retractor inserted, and the tumour examined. If the pedicle is narrow, as it should be if the diagnosis is correct, a Kelly clamp is placed on it and, using the clamp as the active electrode, the pedicle is destroyed and the tumour removed without manipulation. Seed tumours are sought and destroyed by diathermy and the bladder closed with drainage. Here again the prognosis is good if the follow-up is efficient.

While, for the purposes of discussion, we describe tumours as of this or that type, in practice we find all grades from the typical malignant papilloma which I have described through tumours having successively thicker and shorter pedicles, to the typical sessile papillary carcinoma of the cauliflower type. The degree of malignancy can be judged by the pedicle. The nearer the tumour approaches the sessile type, the deeper the infiltration into the bladder wall; the more widespread the area in which wandering cells are found in the submucosa, the more malignant the tumour.

If one treats these border-line tumours having short stumpy pedicles by suprapubic cystotomy and diathermy the operative mortality will be practically nil, and the immediate results excellent, but between 30 and 40 per cent will recur with a greater degree of malignancy in from two to five years. The operation is, therefore, merely palliative, and I consider partial resection of the bladder a better routine procedure. We find at times a type of papillary carcinoma in which the papillæ are definite fronds arising in close tufts from the bladder wall, usually near and on a ureteral opening. These tufts are often multiple. Pyelography

will show them to be strictly not bladder tumours but seed tumours from a papillary growth in the renal pelvis or ureter.

Sessile papillary carcinomata are highly malignant tumours infiltrating deeply the bladder wall, and if neglected adjacent organs and tissues will be involved. Metastases, though not as a rule early, are by no means rare. If sections of the bladder wall adjacent to the tumour be examined under the microscope carcinoma cells, singly and in groups, will be found in the submucosal lymphatics, 5 or 6 cm. beyond the apparent edge of the growth. It is this unseen invasion, the extent of which cannot be gauged before or at operation, which produces early recurrence in many cases of partial resection of the bladder, rendering an apparently adequate operation futile.

When the tumour is located at or near a ureteral orifice, uroselectan should be given and plates taken, shifting the tube at each exposure so that alternate plates viewed together may give a stereoscopic picture. In this way an estimation of the separate and total renal function is obtained and hydro-ureter or hydro-nephrosis outlined; any papillary tumour of the kidney, if present, will be revealed as a filling defect. The plates late in the series provide a good cystogram and the earlier ones will show the presence or absence of metastases in the pelvic girdle or lumbo-sacral vertebræ, the usual site for secondary growths in bone following vesical or prostatic carcinoma. Rectal or vaginal examination must never be neglected. The growth may involve the prostate, cervix or vagina; on the other hand it may be situated beyond the reach of the finger.

With the information thus obtained, together with that obtained by clinical examination, we may determine whether curative or palliative treatment is to be instituted, but to estimate what treatment is curative or what merely palliative we must fall back on past experience.

Among 26 patients who had a partial cystectomy for infiltrating carcinoma I find 5 dead in two months. This is an operative mortality of 20 per cent. Eleven were dead or dying with local recurrence by the fourth year, and three more by the eighth year. This leaves 7 as possible cures. However, 2 of these were lost sight of in the first year, and the other 5 were all recent cases operated upon during the

past three years. The story is thus reduced to the status of "The Ten Little Nigger Boys" and the operation, in our hands, placed in the list of palliative treatments. In 6 other cases in which one ureter was divided and re-implanted the two months' mortality was 50 per cent, and only one patient has survived more than two years (seven years).

Twenty-nine cases treated by suprapubic cystotomy and diathermy showed a two months' mortality of 12.5 per cent. Four patients died of recurrence in two years; one survived to the tenth year and then succumbed. Three are active and being treated at intervals for pedunculated tumours, two, five and nine years after operation; 6 have had no recurrence at periods from three to eight years.

The high immediate mortality in this group was due to the inclusion of some very advanced cases who received the treatment as a possible palliative measure. Omitting these, the operative mortality is negligible and the results much better on the average than those achieved by partial cystectomy. Without doubt, results could be improved by the insertion of radon in the coagulated area, properly spaced over the adjacent 3 cm. of bladder. However, the percentage of cases free of recurrence after five years, *i.e.*, 15, is too low for one to consider the measure a curative proceeding in middle age, although it is probably the treatment of choice where the expectation of life is not more than ten years.

If the statistics I have given are representative of the average results in all clinics, a question I am not qualified to answer, then surely we should consider the advisability of total cystectomy in many more cases and in earlier

ones than has been our custom. Ten more years at least will be required to follow cases already operated upon by the various techniques in use at present. The operative mortality is, however, due to the uretero-sigmoid anastomosis and not to the cystectomy, and I think we sometimes try to be too clever and should be content with bilateral abdominal ureterostomy and cystectomy in all but the better operative risks. The opposition to ureterostomy is to a great extent psychological. Twenty-five years ago the idea of a colostomy was held in horror; now a colostomy is accepted as a matter of course in almost every case of rectal or sigmoid carcinoma.

Bilateral ureterostomy just mesial to the anterior superior iliac spines, with intubation with soft rubber catheters, is no greater inconvenience than a colostomy, and evidence is mounting to show that a kidney will not develop pyelonephritis if drainage is unobstructed even though the pelvis becomes infected, which is of course, inevitable.

For palliative treatment when cystectomy is contraindicated suprapubic cystotomy and diathermy is the treatment of choice, provided a reasonable amount of normal bladder exists. At times one is agreeably surprised by a result far beyond one's hopes. I have had nothing but grief in the use of radium for palliation. Deep x-ray therapy is of use in relieving pain associated with metastases in bone. Intravenous injection of colloidal lead will, in some cases, lessen the strangury and delay the resort to morphia. It is not so effective as ureterostomy, but has the advantage of simplicity. Careful dosage is required to avoid lead poisoning.

CYCLOPROPANE ANÆSTHESIA.—H. R. Griffith considers that cyclopropane is a safe, pleasant, powerful, and controllable anæsthetic agent which can be used in almost every type of case and which can almost entirely replace the unpleasantness of ether. In about 90 per cent of 1,108 cases he found it possible to obtain adequate relaxation without the addition of ether, and in the few abdominal cases where an additional anæsthetic was required he tried very small amounts of chloroform with success. In 371 cases he used avertin premedication, and thinks that this combination is the nearest approach to the ideal anæsthetic which has yet been reached. The carbon dioxide absorption technique has always been used by Griffith because of the high cost of cyclopropane, and he thinks that he would adhere to closed circuit methods even if the agent was cheapened. He starts inducing with this gas because of its pleasant smell and the speediness with which sleep is obtained. There has been no death in his series traceable to the anæsthesia, and no real case of post-operative pneumonia. The

danger of explosion is relatively slight since the closed circuit is invariably employed. There is probably more tendency to capillary oozing than with ether, attributable perhaps to a vasomotor effect on the smaller arteries. E. A. Rovenstine commends cyclopropane anæsthesia in thoracic surgery because the respirations are not stimulated, and mixtures with high oxygen tensions can be arranged to produce any degree of surgical anæsthesia. Intratracheal operations are facilitated, and there is no irritation of the mucous membrane. The cautery or electric knife cannot, however, be used with safety in cases where the lungs may be opened. The potency of the gas and the rapidity with which high concentrations may be administered require that its use should be very carefully guarded. The results of 160 thoracic operations show that in patients handicapped by respiratory abnormalities or disease somewhat better surgical results may be obtained with cyclopropane than with other anæsthetic agents.—*Current Researches Anæsth. & Analg.*, Nov.-Dec., 1935, pp. 253 & 270. Abs. in *Brit. M. J.*

Case Reports

A CASE OF EXTREME DIFFUSE DILATATION OF THE ŒSOPHAGUS

By WILLIAM OLIVER STEVENSON, M.B.,
F.R.C.S.(E.), F.R.C.S.(C).

Hamilton

Mr. A.S., aged 60, a fruit farmer, was admitted to St. Joseph's Hospital, Hamilton, on December 7, 1932, with the following history.

Past history.—Since the age of seventeen he had been troubled with attacks of "indigestion". These would take the form of inability to eat certain things without distress in the upper abdomen. There were eructations of food at times and flatulence. For long periods he would be well. He obtained most relief by watching his diet and giving up the things which disagreed with him. His weight averaged 180 pounds.

He carried on throughout his life without medical attention until the spring of 1931. At this time he had a bad accident while ploughing in the field. The plough suddenly struck an obstruction, the horses ran away and dragged him some thirty feet, the plough-handle striking him in the upper abdomen. Following this accident his symptoms returned in an exaggerated form. He gradually eliminated solid food, and was troubled a great deal with eructations of gas and mouthfuls of food. He also had a continuous burning sensation, which he felt to be deep in his chest behind the sternum. He gradually lost weight, and in August, 1932, weighed only 88 pounds. A diagnosis of malignancy was made at this time by a village physician who had no x-rays available. On his return home, another physician placed him on a Sippy diet and alkalies and he gradually increased weight to 110. During the two weeks prior to admission he began to lose weight again, with an exaggeration of his symptoms.

Physical examination.—Height, 5 feet 10 inches. He had a large bony frame, and was exceedingly thin. His disposition was cheerful, not that of a patient suffering from malignancy. Temperature 97, pulse 60, respirations 18.

Urinalysis normal. Blood chemistry: urea nitrogen 36.4, creatinine 2.6, blood sugar 1.25; red blood cells 4,070,000; white blood cells, 9,800; haemoglobin 55 per cent. Examination of the chest did not reveal any abnormal lung sounds. The heart sounds were normal. There was a slight delay in expansion on the right side of the chest. The abdomen was scaphoid, but normal to palpation. The movements of the diaphragm were normal on respiration.



Fig. 1

X-ray examination.—A reference to Fig. 1 shows tremendous diffuse dilatation of the œsophagus extending from its origin down to the diaphragm. This dilatation takes up at least one-third of the space of the right lung. There is a very large pouching into the right costo-phrenic angle. A large diverticulum extends into the left costo-phrenic angle. It was very difficult to locate the cardiac orifice, and it was not until the third day that barium was seen to pass into the stomach. When the patient was turned on his left side, a striking picture (Fig. 2) was seen—a long fluid level in the œsophagus,

with its walls dilated and fixed to the surrounding lung. The extent of the diverticulum is also shown.

Diagnosis.—Extreme diffuse and localized dilatation of the œsophagus, the result of life-long cardiospasm.

Treatment.—The œsophagus was washed out with large quantities of saline and soda. It was estimated to hold at least one imperial gallon. An œsophagoscope was then passed to confirm the diagnosis and to try to locate the cardiac orifice. No satisfactory conclusion was reached

the cardiac orifice was palpated. The little finger was inserted with difficulty, it taking two to three minutes to pass it completely. The next twenty minutes were taken to gradually dilate the orifice, using one and two and three fingers. This was done very carefully, to prevent rupture of the mucosa. A width of 7 cm. was obtained. It was found that the only direction in which the cardia could be dilated was in the transverse diameter. It was blocked behind by the vertebral column and the aorta and in front by the tendinous portion of the diaphragm. Upon completion of the dilatation, the stomach was sutured and the wound closed.

Progress.—The patient's condition gradually improved. It took about two weeks to accustom the stomach to a light general diet, which was gradually increased. He was relieved of the burning distress behind the sternum. Six weeks after operation his bowels were moving normally every day and he had gained enough strength to be up on his feet. He left hospital on April 30, 1933, weighing 120 pounds. During the following summer, he gradually assumed



Fig. 2

as to its location. It was therefore futile to try to pass a tube or a bougie into the stomach. Attempts were then made to have the patient swallow a string and shot, but these always fell into the diverticulum.

Operation was performed on January 25, 1933, under ether and the abdomen opened by a high left rectus incision. Due to the scarcity of abdominal fat a very striking picture was obtained of practically all the abdominal organs. The omentum was simply a thin layer composed of folds of transparent peritoneum. Parts of the kidneys and the pancreas, as well as the large blood vessels and nerves, appeared just as in a transparent photograph. The stomach was normal in size and position. The liver was pale, but of normal size. The gall bladder was normal. The small intestine was contracted and occupied the pelvis. A two-inch incision was made on the anterior surface of the stomach midway between the greater and lesser curvatures. The region of

his occupation as a truck-gardener.

In November, 1934, skiagrams were again taken. The dilatation of the œsophagus was somewhat improved, but the diverticulum was still present. The barium meal passed freely and at once into the stomach. The patient weighed 146 pounds. He was able to eat a good vegetable diet, but meat did not agree with him. He found that he had no trouble when he masticated his food thoroughly and ate slowly. He did not have to take medicine of any kind.

He that desireth helth of bodye must eschew and avoid great charges of thought and care. For thought dryeth up man's body, hurting and leavyng ye spirites in desolation and comfortless.

To eschew anger, for anger in like manner drieth up the bodye and excessive chaufeth and inflameth the membres.

Here are taught three generall remedies to conserve in helthe all creatures and especially noble men: The fyrste is to live joyfully; for joye and myrth causeth man to be yonge and lustye.—“Regimen Sanitatis Salerni.”

A FOREIGN BODY TRAPPED BY MULTIPLE STRICTURES OF THE ŒSOPHAGUS*

BY J. GRANT STRACHAN,

Toronto

Stricture of the œsophagus in children due to swallowing lye is an all too common condition. In the routine treatment of the condition the œsophagoscopist often has to remove foreign bodies impacted in the stricture. A foreign body trapped between two strictures must be a rarity, and as such is considered worthy of record.

solution under the usual tragic circumstances. He was pitifully emaciated and frantic for fluids. Acetone was easily demonstrated in his urine. Shortly after admission he was given glucose solution intravenously. Several hours later that day his œsophagus was examined under ether.

At the level of the cricoid cartilage a pin-point stricture was found and dilated easily to No. 26 bougie. Beyond this stricture the œsophagus contained much bloody debris and pieces of decomposing fleshy material. The mucosa had a red macerated appearance. A second stricture was felt near the diaphragm level. It was rather tight and was dilated after

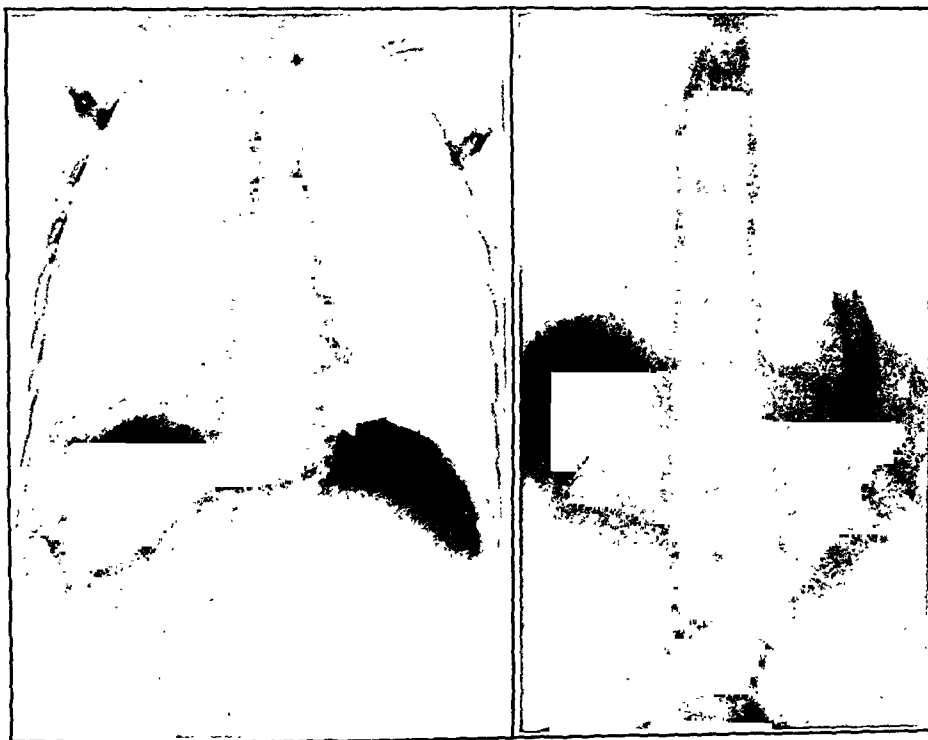


Fig. 1

Fig. 1.—Plate showing barium in œsophagus, to demonstrate upper stricture.

Fig. 2

Fig. 2.—Plate showing watch wheel in œsophagus and feeding tube in stomach.

A.N., a French-Canadian boy of five, living in a town in northern Ontario, was admitted to the Hospital for Sick Children, Toronto, on October 22, 1928. For five days previously he had been unable to swallow. Fluids had been regurgitated and he had lost much weight. Three months before he had drunk some lye

some effort to No. 16. The following day the child could swallow fluids well and his general condition was much improved. A barium meal was given and an x-ray plate made (Fig. 1). Routine œsophageal dilatation was commenced and carried out under anæsthesia at varying intervals. Rapid dilatation of the strictures and the maintenance of the patency gained by further treatments at ever lengthening periods was the intention, but inter-current illnesses (chicken-pox, mastoiditis, etc.) retarded pro-

* Presented before the Section of Oto-Laryngology, Academy of Medicine, Toronto, on November 20, 1933.

From the Department of Oto-Laryngology, Hospital for Sick Children, Toronto.

gress. Home conditions and the great distance away of his home necessitated hospitalization.

On September 4, 1929, he was discharged with instructions to return for further treatment in a month or so. Nearly twenty-six months elapsed, however, before he returned, and only after he had been sought out and some kind people had made his transportation possible. He arrived on November 5, 1931, very emaciated, literally starving, and only able to take fluids with difficulty. Examination of the œsophagus revealed a condition very much like that seen on his first admission. Regular dilatations were commenced, but dilatation of the lower stricture was most unsatisfactory and very little progress was made. Finally, in despair, the surgical service was asked to perform a gastrostomy.

On March 16, 1932, gastrostomy was done by Dr. A. B. LeMesurier, and a large tube left *in situ* for feeding. About a week later, a tiny lead shot with thread attached, was swallowed. The thread was recovered from the stomach using the œsophagoscope through the gastrostomy wound. Dilatations were recommended, using Tucker's retrograde bougies from above instead of through the abdominal wound. The feeding (stomach) tube was removed and the wound closed spontaneously except for a small fistula for the silk thread. Again many interruptions to the treatment occurred. Several times the thread was chewed; a fresh one had to be swallowed and recovered from the stomach. This accident was prevented by bringing the thread out through the nose.

It was during one of these episodes that the house surgeon, on fluoroscoping the chest to check the progress of the shot, discovered a foreign body, a watch-wheel, in the lower end of the œsophagus (Fig. 2). Apparently, shortly after arriving home from his first visit to the

hospital he had accidentally swallowed the wheel, and had kept his secret. An x-ray plate of his œsophagus had been made on his first admission and the necessity for a second plate had not arisen. Both strictures had now been dilated to No. 36 Tucker's bougie.

It now became necessary to remove the foreign body. After some difficulty it was located, firmly imbedded in a mass of granulations, apparently just above the lower stricture. A long hook and sharp jerk brought it spinning up the œsophagus, to defy removal through the upper stricture. The largest Brunning or Jackson tube in our possession would pass through the stricture, but would not take the wheel. The periphery of the wheel was corrugated and there was, of course, the axle to contend with. Any attempt to drag the wheel through the stricture threatened evisceration of the œsophagus. Finally, a large Jackson œsophageal spatula was inserted through the stricture, the wheel firmly grasped, and although the periphery caught the stricture in front, the axle cleared. A sharp pull sufficed to remove the wheel. Subsequent treatment consisted in dilatation from above. The abdominal wound healed, and on June 6, 1933, the boy was discharged. The boy returned for examination on June 14, 1934, and December 15, 1934, at which times he was in good condition and able to swallow solid food. The patency of the strictures was well maintained.

The question frequently arises, "What becomes of these cases?" The cited case partially supplies the answer. After a year without treatment the strictures were found well dilated. Unquestionably, further treatment of this case will be necessary, but the intervals between treatments will increase, until eventually the strictures should show little tendency to contract.

HISTAMINE TREATMENT OF RECURRENT URTICARIA.—Fiessinger and Gajdos report 6 cases of recurrent urticaria treated by histamine ionization. A compress moistened with a 1 in 10,000 watery solution of histamine hydrochloride was placed over the epigastrium and covered with an aluminum plate. The plate was connected to the positive pole of a battery and 6 to 10 mA were passed for five to ten minutes. The negative pole was held in the patient's hand. It was found necessary

to give as many as twelve treatments on alternate days. In all 6 cases complete cessation of the urticaria resulted, but the authors do not claim that the treatment will be invariably successful in every case; cases of pruritus from other causes were not affected by this treatment. They discuss the rationale of histamine therapy, which they compare with anaphylaxis. They know of no contraindications, and find that it has no effect on gastric acidity.—*Presse Méd.*, Nov. 27, 1935, p. 1913.

Clinical and Laboratory Notes

A MODIFIED TECHNIQUE FOR THE REPRODUCTION OF X-RAY FILMS*

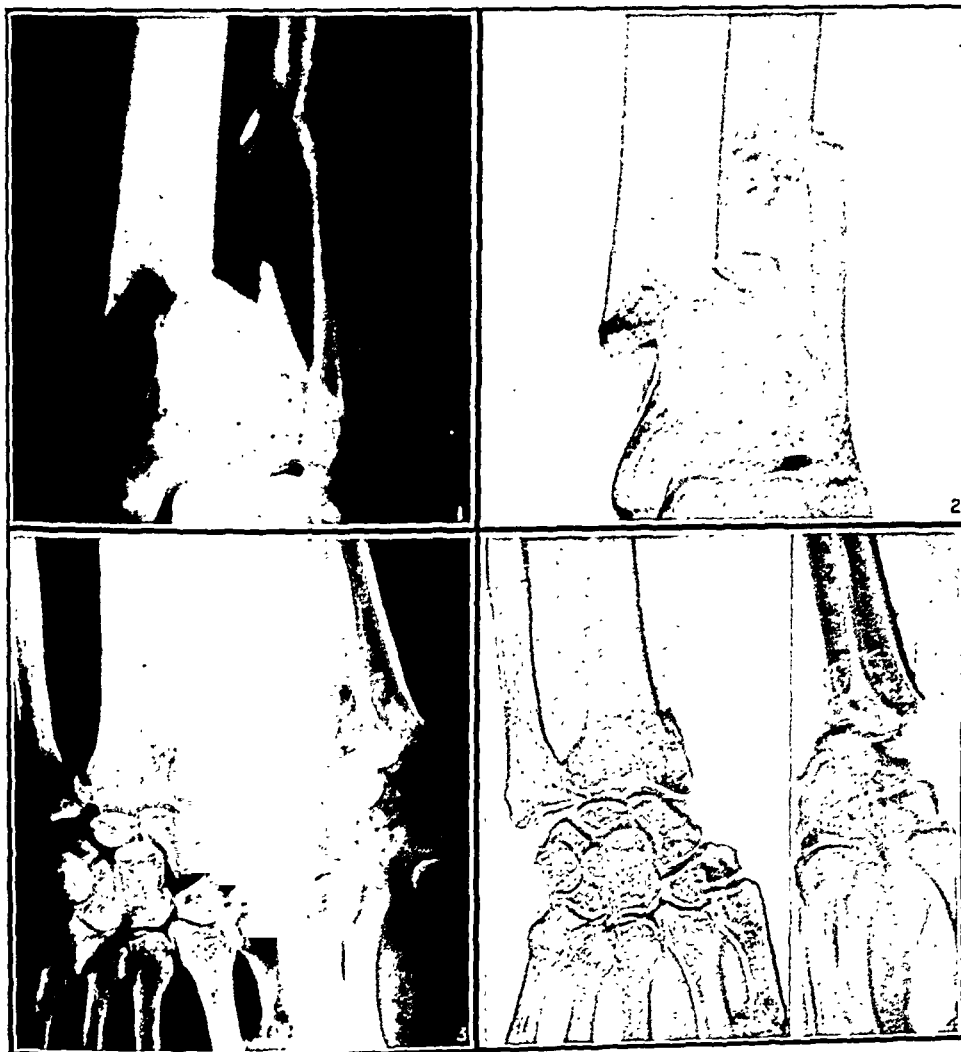
By E. R. SECORD, M.D., J. H. MOSS AND
HAZEL DIAMOND,

Brantford, Ont.

During the years that have elapsed since Roentgen's discovery of the "X-Ray", material improvement has taken place in the quality of the films produced, the reasons for which include better films, the use of the screen, the Bucky

* From the Radiological Department, the Brantford General Hospital.

diaphragm, and better tubes and sources of current supply. That there has not been a parallel improvement in the reproduction of the film for illustrative purposes appears self-evident, for the illustrations both in journals and even in expensive text-books on radiological technique leave much to be desired. In an attempt to improve this situation we were led to experiment with the suggestion of J. F. Brailsford¹ that the print should be made from superimposed positive and negative films placed slightly off centre. We now present for purposes of comparison a small collection of prints made by the usual process, and by this modified plan,



Figs. 1 and 2.—Fracture of tibia and fibula. Figs. 3 and 4.—Colles' fracture.

(Figs. 1 and 3 are from photographs taken by the usual method; Figs. 2 and 4 represent the same bones taken by the method described here).

and we feel that the improvement in results will well repay the additional labour involved.

The technique is as follows. (1) The original "x-ray" film is made in the usual manner. For purposes of clarity this film is designated "*the negative*", even though this term, borrowed from photography, may not be quite correct. (2) The negative is placed in a printing frame and covered by another film of the same size, the frame being then exposed to light, the second film, developed and fixed, becomes "*the positive*". We use a 14 by 17 inch printing frame, so that any size of film may be handled, and we would advise that when smaller films are being used they should be very carefully packed accurately into one corner of the frame and care be taken that the film which is to be the positive exactly covers the negative. (3) The negative and the positive are now superimposed in the printing frame. This is most easily carried out by placing the frame over a box containing an electric light bulb. Having the two films exactly superimposed, the one nearest the operator is now shifted sideways about $\frac{1}{8}$ inch. Immediately an unusual effect is produced, consisting in one edge of the image being sharply delineated by a black line while the other side shows a white line, and at the same time the detail of the image stands out as if viewing a mould of the object. It may be noted that the shift is *sideways*, and in most instances this is sufficient, because most of the important structures in the film are vertical. In certain cases where there is also horizontal detail, an up or down shift may be added, but this will be less than the sideways shift and in most cases may be neglected. The exact amount of the side shift will vary with almost every film and can best be determined by the operator viewing the result in the printing frame illuminated from below. Having determined the best position, the two films are firmly held in position by the dry fingers of the left hand, the light is switched off, and a third unexposed film is placed over the combination. The frame is closed, exposed, and the third film, developed and fixed, gives us the "*composite film*". This is intended for use in a "viewing box".

(4) If however one desires a print for publishing purposes, the same process is carried out, with the exception that printing paper is used instead of the third film. This gives us the "*composite print*". It is to be noted that this composite print is *not* a print of the composite film, but a print taken as described from the superimposed positive and negative and hence we use the designation "*composite print*".

REFERENCE

1. BRAILSFORD, J. F.: Serial radiographic appearances of neuropathic shoulder-joint, *Brit. J. Surg.*, 1935, 22: 424.

THE ATMOSPHERIC POLLEN IN MONTREAL

By H. E. MACDERMOT, M.D. AND G. R. HOWELL,

Montreal

During the summer of 1935 we began making observations on the pollen content of the atmosphere in Montreal, and the present note is a preliminary contribution which it is hoped will be amplified within the coming summer. There have been several surveys of the pollen content of the air in various large cities on this continent, but apparently none has yet been published for Montreal.* A complete survey is of course an extremely laborious proceeding, and we selected one pollen only for investigation, *i.e.*, ragweed. No distinction was made between the short and giant types, but this is of no great importance from the point of view of the hay-fever patient.

As is well known, ragweed is by far the most important causative factor in seasonal hayfever and asthma in this part of the continent. It fulfils all the postulates laid down by Thommen:* (a) it is anemophilous, or windborne, in its mode of spread; (b) it is extremely buoyant; (c) it is produced in large quantities; (d) the

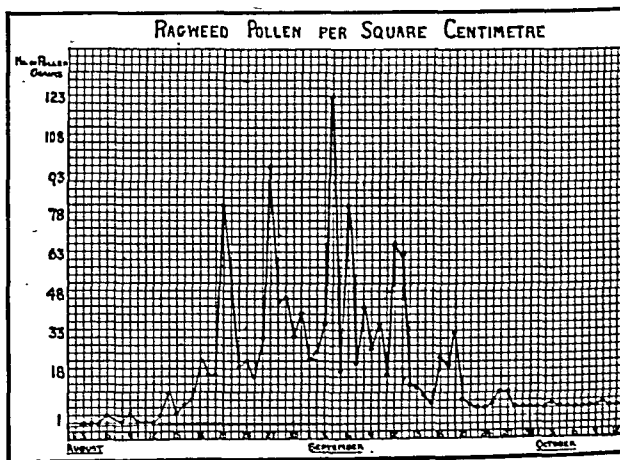


Chart 1

plant is widespread; and, last, and very far from least, (e) it possesses that undefined capacity as an irritant which fortunately is shared equally by very few other pollens.

Whatever other value such studies as this may have they should at least serve to emphasize the significance of the hayfever problem, and to

* See Coca, Walzer and Thommen: Asthma and Hayfever, Chas. C. Thomas, Springfield, Ill., 1931, p. 718. Also Feinberg: Allergy in General Practice, Lea & Febiger, Phila., 1934, p. 227. In the latter the pollen survey of Montreal, referred to as done by the Canadian Meteorological Service, gives no details.

support any attempt which may be made to reduce the amount of ragweed, or to prevent its increase.

The pollen count was done as follows. Beginning on the 1st day of August, an ordinary glass slide, lightly vaselined, was exposed daily on the roof of an uptown apartment building, in the middle west end portion of Montreal. The ragweed pollen grains were counted over an area of one square centimetre of each slide, and the number recorded for each day. This is admittedly a limited method of sampling, but even so it serves to show how definitely the pollen rises after the middle of August, attains its peak in the first week of September, and then begins to drop. Counts were not carried beyond October 12th, but even then there was still some pollen in the air.

We did no correlation of the amount of pollen with the degree of symptoms in patients, but it is perfectly well established that the period of most acute symptoms coincides closely with the increase in the amount of pollen as shown in the chart. Wind of course will increase the amount of pollen in the air, and rain will decrease it, but in spite of some rainy days there never was a complete absence of atmospheric pollen in the period recorded.

PITUITARY SPASM REMOVED BY ADRENALIN*

By GORDON GROTE COPELAND, B.A., M.B.,
Consulting Obstetrician and Gynaecologist,
Toronto Western Hospital,
Toronto

The injection of pituitary extract after the birth of the baby and before attempts are made to express the afterbirth is extensively practised. Many obstetricians feel that post-partum bleeding is less, the placenta more readily delivered, and shock reduced. On rare occasions, however, spasm of the cervix has resulted, with retained afterbirth. It is my impression that this unfortunate accident is an idiosyncrasy, since other ampoules from the same batch gave normal results in other patients. I should like to know of any reliable method whereby such an idiosyncrasy can be predicted. It would also be of interest to learn whether spasm of the cervix has ever followed the injection of pitocin.

The antagonistic effect of adrenalin to the

effects of pituitary extract has been recognized for several years. Adrenalin has also been used successfully to relax the cervix just prior to attempting to manually replace a recently inverted uterus, or as a preventive agent against threatened rupture of the uterus, as recommended by Rucker.¹ If there is anything original in my use of adrenalin, it is in giving it to overcome spasm of the cervix with retained afterbirth which has followed the proper injection of pituitary extract. It seemed to me a logical procedure in view of the known actions of adrenalin, and it worked. To wait, perhaps for hours, for such a spasm to wear off, has obvious disadvantages. The alternatives, deep anaesthesia, or local anaesthesia of the cervix, are not without danger.

CASE HISTORY

Mrs. P., Greek, aged 40, I-gravida at full term, some 24 hours in a dry labour with slow progress and exhaustion. On examination I found the fetal heart sounds in the right lower quadrant, well down in the flank, 160 beats per minute and irregular. The cervix was thin and 90 per cent dilated; the head was in the mid-pelvis and right occipito-posterior position.

Under ether anaesthesia administered by Dr. Robertson, I fully dilated the cervix, rotated the head and shoulders anteriorly, applied forceps and extracted a living baby whose head was much moulded. While repairing a slight laceration, I had the nurse inject 0.5 c.c. of pituitary extract, remarking that I thought blood loss was less following its use.

After waiting about twenty minutes, attempts were made to express the afterbirth. We all tried our best, but failed. At length I made a careful vaginal examination, and found the cervix tightly closed. I fortunately remembered the use of adrenalin in relaxing the cervix in other circumstances, and thought it might also work here. I had the nurse inject 5 minims of adrenalin, 1/1,000. Holding two fingers against the cervix, in three minutes I felt the cervix relaxing, and in five minutes it had opened to the size of my fist, and was soft. Manual expression was then easily accomplished. Mother and baby did well.

It is worth remembering that pituitary extract is a powerful drug capable of producing harmful effects quite unexpectedly, even when proper indications for its use are present. When given before expression of the afterbirth, and if great resistance is encountered when attempts are made to expel it, it is well to determine whether a spasm of the cervix has occurred. If the cervix is found firmly closed the timely injection of adrenalin may overcome it, and thus more dangerous procedures will be avoided.

REFERENCE

1. RUCKER, M. P.: Bandl's contraction ring-treatment with adrenalin, *Am. J. Obst. & Gyn.*, 1927, 14: 609.

* Read before the Section of Obstetrics and Gynaecology, Academy of Medicine, Toronto, November 7, 1935. (Condensed.)



Editorial

KING GEORGE THE FIFTH

WE were prevented by the exigencies of our printing from taking official notice before this of the death of King George V. We do so now in the full assurance that our Association, indeed we might confidently say the entire Canadian medical profession, would wish to pay formal tribute to his memory, and express in the fullest possible manner our deep sense of loss.

King George was one of those whose greatness drew forth but little comment during his lifetime. He occupied his position so unobtrusively and yet with such complete devotion to his duties that the extent of his influence was never so evident as when it was withdrawn. In all that has been written about him there is an impressively unanimous acknowledgment of his rare simplicity and unfailing steadiness of mind. It is one of the duties of a monarch to enter into his subjects' feelings, but it is doubtful if there has been any other monarch whose subjects felt that they could so freely enter into his. It was a perfect understanding, which could only have existed with one whose simplicity was complemented by true dignity.

The interest of King George in medical affairs has been drawn attention to in the *British Medical Journal* (Jan. 25, 1936, 187). It was no perfunctory interest. As Prince of Wales he was at one time President of five large London hospitals, and this interest continued and increased. The aftermath of the War exercised his benevolent attention to the full. On the occasion of his silver wedding, in the latter months of the War, the City of London gave him £53,000. To this he added a further £25,000 from his own purse and handed it over to the King's Fund for the Disabled.

As a link with the Canadian Medical Service, it may be recalled that after the King's accident during the War, when he was severely bruised by a fall from his horse in France, he was nursed by a Canadian nurse from No. 1 Canadian Casualty Clearing Station, Miss V. A. Tremaine, of Quebec, who remained with him until his complete recovery at Buckingham Palace.

The severe infection from which King George suffered in 1928 has been sufficiently often referred to. As regards his final illness we may quote from the *British Medical Journal* (*loc. cit.*) as follows:

"Though it is understood that for some weeks His Majesty's health had not been altogether satisfactory the King was able to go out, and in fact rode on his pony for a short time on Wednesday, January 15th. On Thursday, January 16th, the King showed signs of a mild catarrh, which soon began to abate.

The 'disquiet' expressed (in the bulletins) on Friday and Saturday arose from evidences of cardiac insufficiency. The margin of cardiac reserve had in recent days been narrowing. This illness therefore arose from within, and was in the nature of a culmination. It was thus not comparable to the invading streptococcal septicæmia localizing at the base of the right lung from which King George suffered seven years ago. That illness inevitably placed heavy burdens on the heart, and therefore may have had a causal relationship to this last illness. It is a remarkable achievement for King George to have recovered from septicæmia and to have reigned over his Empire for seven years through times which have been eventful and sometimes anxious.

This last brief chapter of the King's life showed that the body carried through its work till its powers were ended and then came to rest after an illness short and peaceful in its close."

H.E.M

The following message has been sent to our new King by The Canadian Medical Association.

To His Most Gracious Majesty, King Edward VIII.

SIR:—

On behalf of the members of The Canadian Medical Association, we desire to express to your Most Gracious Majesty our profound sympathy for you and the members of your Royal House in the incomparable loss you have sustained in the death of your father His Most Excellent Majesty, King George V.

In common with our fellow citizens throughout Canada, we shared the pride that was enjoyed by all in your Canadian citizenship. We are profoundly grateful for the interest you have shown in this part of the vast Empire over which you are now the revered Sovereign.

For ten years The Canadian Medical Association has enjoyed the honour conferred upon it by you when you graciously consented, as Prince of Wales, to become its Patron. And now, on your accession to the throne, we, as a professional group of Canadian citizens, wish to affirm our deep affection for your person and our unswerving loyalty to you, our beloved Sovereign.

On behalf of The Canadian Medical Association, constituting a group of Your Majesty's most faithful subjects and devoted servants, I have the honour to be

(Signed) T. C. ROUTLEY,

General Secretary.

THE CLINICAL FEATURES OF CORONARY DISEASE

CORONARY disease produces anatomical changes of a serious character both in the coronary arteries themselves and in the muscle which they supply. It is an insidious process, taking years for its full development. For long there may be no clinical manifestations, or these may be so trifling that they are disregarded, until attention is riveted upon the condition through the occurrence of angina pectoris or the manifestations of coronary occlusion, the latter an event which usually presents itself with dramatic suddenness. In the early stages, and for a long time, while the major coronary trunks may be involved, the pathological changes, so far as immediate results, at least, are concerned, chiefly centre about the finer, arteriolar, ramifications and their immediate neighbourhood. This means a steadily increasing starvation of the cardiac muscle from diminution of its blood supply, resulting in atrophy of the muscle fibres in many scattered areas and their replacement by fibrous tissue, a structure that has no contractile value. Thus we get what is commonly called "chronic degenerative myocarditis", a faulty term, as the condition is

not inflammatory. The grosser changes in the main coronary trunks take longer to produce their effects, but result in loss of elasticity and contractility followed by narrowing of their lumina. Infarction of the heart wall, usually from thrombosis, is the last phase, very often.

The clinical manifestations of coronary disease are very variable, depending on the stage at which the morbid changes have arrived, the extent and position of the lesions, and the amount of reserve power of the heart. At first they may be slight, the patient noticing only that he has a little shortness of breath or some disagreeable palpitation on a degree of exertion that had previously caused him no inconvenience. His disability may increase until we get definite evidences of heart failure—urgent dyspnoea, a dilated heart, oedema of the lungs, dropsy, congestion of the liver—one or more of these. This is, *a priori*, only what we would expect. Frequently there has been hypertension also. Pain (angina pectoris) may or not have been complained of at some time previously. Here may we interpolate a protest against the common

practice of discussing "angina pectoris" as if it were a disease entity rather than a symptom, like any other pain. There are excellent reasons for maintaining our view, but we cannot enter into them now. Oille and Rykert¹ follow a common practice of dividing the clinical manifestations of coronary disease into three groups—chronic degenerative myocarditis, coronary occlusion and angina pectoris. They state that in 20 to 25 per cent of cases of angina pectoris nothing can be found wrong with the heart. This, we presume, refers to the physical examination. It would be unsafe to conclude from this that the heart is normal in angina pectoris. In fact, the evidence points the other way. Moritz and Beck² in a report on 94 cases of coronary occlusion note that 14 of the patients suffered from typical Heberden's angina; in every one of these they found coronary sclerosis and myocardial fibrosis. Angina pectoris of the true Heberden type undoubtedly means organic disease of the myocardium, with the rarest exceptions.

As time goes on, if the subject of coronary disease does not succumb to cardiac failure, he may or may not suffer repeated anginal attacks, but eventually will develop coronary occlusion. The well-recognized manifestations of this last condition are the following: severe persistent pain in the chest, lasting for a few hours or a few days, of sudden or gradual onset, with or without vomiting; shock, sweating, pallor or cyanosis, dyspnoea, a rapid thready pulse, distant heart sounds, a new cardiac rhythm, a fall in blood pressure, and oedema. We may get a pericardial friction after a day or two in cases where the infarcted area reaches the outer surface of the myocardium. There may also be a leucocytosis and a somewhat more tardily developed pyrexia, expressions of an inflammatory reaction.

But there are atypical cases in which the symptomatology may differ from that of the classical syndrome, either quantitatively or qualitatively. Thus, pain may be lacking or negligible and some other feature or

features may dominate the picture—an inexplicable sense of apprehension, marked dyspnoea, congestive heart failure, and the appearance of a pathological rhythm. Moreover, these indications may set in in a very quiet way, to gain intensity as time goes on. Again, the rare case has been met with in which the patient has weathered an attack of coronary thrombosis without being aware that he was in a serious condition.

Where myocardial infarction has occurred death may be immediate, speedy, or delayed. Where life is spared for a time the patient may die of intercurrent disease, may suffer subsequent attacks, or may develop cardiac failure.

From the patient's point of view pain is probably the most insistent feature. It is commonly held that anginal pain is sudden and severe. This is not altogether the case. The pain has no one particular characteristic. To quote Oille and Rykert (*loc. cit.*), "It may be a slight discomfort, a fullness, a pressure, a constriction, a burning, a dull ache, or a severe pain. It is a continuous wave of pain without rapid vibrations. It develops gradually, reaches the crisis, and gradually dies away. It is most frequently located in the middle line. It may radiate to one arm or both arms, to the shoulders, to the back, or to the neck, or, occasionally, to the face."

The incidence of pain in coronary disease is a variable thing, even in the most advanced stage. In their study of 90 cases of coronary disease *post mortem* Oille and Rykert (*loc. cit.*) found that pain was a predominant feature in only 29 instances. Saphir and his co-workers,³ in 32 cases of coronary thrombosis obtained a history of pain (during rest) in four only. They note also, as have others, that attacks of pain typical of cardiac infarction may occur in the absence of this lesion.

To explain the origin, nature and degree of anginal pain is a difficult task, one perhaps impossible in the state of our present knowledge. The most generally accepted theory is that anginal pain is due to ischaemia of the cardiac muscle, a theory linked up by

1. OILLE, J. A. AND RYKERT, H.: The clinical manifestations of coronary disease, *Canad. M. Ass. J.*, 1935, 32: 35.

2. MORITZ, A. R. AND BECK, C. S.: The production of a collateral circulation to the heart, *Am. Heart J.*, 1935, 10: 874.

3. SAPHIR, O., PRIEST, W. S., HAMBURGER, W. M. AND KATZ, L. N.: Coronary arteriosclerosis, coronary thrombosis, and the resulting myocardial changes, *Am. Heart J.*, 1935, 10: 567 and 762.

Sir Thomas Lewis and his co-workers with the idea of the liberation of a pain-producing substance. There is much evidence to support this notion, part of it based on animal experimentation. There are, however, discrepancies in the findings of certain investigators which should be finally cleared up. In their experiments Sutton and King, Pearcey, Priest and Van Allen, and Sutton and Lueth (quoted by Katz, Mayne and Weinstein⁴) found that pain was caused immediately on the occlusion of the coronary arteries and that this pain ceased as soon as the vascular occlusion was released. Is this pain due to ischæmia of the myocardium or to trauma of the nerve fibres about the coronaries? Ten years ago Singer⁵ stated that acute ischæmia of the heart muscle could be produced without exciting painful reactions. Sutton and Lueth⁶ found that injury of the pain fibres in the adventitia of the coronary arteries would cause pain. Katz and his collaborators, however (*loc. cit.*), could not always duplicate their results. To clear up this matter they repeated some of the experiments and concluded that the painful response is due not to occlusion of the coronary artery but to stimulation of the afferent fibres in the nerve plexus surrounding the vessels, and that ischæmia of the myocardium is at most only one of many mechanisms operating of the nerve endings and nerve fibres which may give rise to anginal attacks. Dogiel⁷ was the first, nearly forty years ago, to demonstrate that there were

sensory nerve endings in the adventitia of the coronary arteries. Woollard,⁸ recently, has shown that the nerves to and from the ventricles are concentrated chiefly around the coronary vessels, where they form a loose spiral network, and Harvey, together with many others, has proved that the rest of the myocardium is devoid of fibres sensitive to pain. All this suggests that if ischæmia causes pain it does so by stimulating the end-organs located in and about the coronary tree. Stimulation may take place, theoretically, through diffusion of the pain-producing substance from the myocardium to these end-organs or by a concentration of the pain-producing substance formed locally.

Stimulation of the nerve endings is not necessarily due to chemical substances, however. Sudden rises in blood pressure from many and various causes, by distending the coronaries, may mechanically stimulate the nerve endings in their walls and so cause pain. Katz and his co-workers (*loc. cit.*) suggest, further, that the arteriosclerotic process as it spreads to the adventitia of the coronaries, or if associated with periarterial changes, may at first render the nerve endings within the walls over-sensitive and later, by destruction, insensitive to stimulation. Such conditions would almost certainly alter the responses. In the state of hyper-irritability stimuli which ordinarily would not affect the pain endings might readily do so and give rise to an anginal attack. Lesions near the orifices of the coronaries would, for anatomical considerations, be more likely to cause pain than would those in and near the finer ramifications. Infarction of the heart wall, if extensive, might be expected to cause destruction of the nerve endings caught in the process and so eliminate pain.

A. G. N.

4. KATZ, L. N., MAYNE, W. AND WEINSTEIN, W.: Cardiac pain: presence of pain fibres in nerve plexus surrounding coronary vessels, *Arch. Int. Med.*, 1935, 55: 760.

5. SINGER, R.: Experiments on sensibility of heart and larger vessels to pain and its relation to angina pectoris, *Wien. Arch. f. inn. Med.*, 1926, 12: 193.

6. SUTTON, D. C. AND LUETH, H. C.: Pain, *Arch. Int. Med.*, 1930, 45: 827.

7. DOGIEL, A. S.: The sensory nerve endings in the heart and blood-vessels of mammals, *Arch. f. mikr. Anat.*, 1898, 52: 44.

8. WOOLLARD, H. H.: Innervation of the heart, *J. Anat.*, 1926, 60: 345.

THE TREATMENT OF EPISTAXIS.—According to J. Zange tamponage of the nose in severe epistaxis should be done with gauze which is neither dry nor soaked in styptic solutions. It is more effective and less liable to cause trauma in insertion and removal if soaked in a mixture of adeps lanæ 72, boric acid 10, and liquid paraffin 18 parts. In hypertonic and arteriosclerotic patients, as well as in those in whom the bleeding comes from regions in the back of the nose which are difficult of access, Zange strongly recommends the withdrawal of

100 to 500 c.cm. blood from an antecubital vein. This operates in some cases by reducing blood pressure, and in others owing to reflex vascular changes, the response to a single massive bleeding being entirely different from that due to the gradual bleeding of the epistaxis. On the other hand, serious nasal bleeding in hypotonic and exsanguinated patients, especially those with a hæmorrhagic diathesis, may call for blood transfusion in addition to plugging.—*Med. Welt*, October 12, 1935, p. 1458. Abs. in *Brit. M. J.*

DOMINION PARTICIPATION IN PUBLIC HEALTH

THE Canadian Medical Association has recorded its opinion that the Dominion should give leadership in public health, provide subsidies through the provincial departments, and that continuance by the provinces of their interest and support is desirable. It is of particular interest to learn what is being planned for, along these lines, in the United States of America.

The Social Securities Act, passed at the last session of Congress, authorizes Congress to make certain appropriations. It is anticipated that the present Congress will act on this authorization and that money will soon be available. The sum of money which will be spent under the direction of the United States Public Health Service will make possible an expansion of present activities, rather than seek for the creation of new ones. The exception to the general statement is the proposed provision for the training of public health personnel.

Eight millions will be provided to promote state and local public health work and two millions for research work. The allotment to states is to be made at the discretion of the Surgeon-General, who is to take into consideration population, special health problems, financial needs. The Act does not interpret these points. It is understood that the Public Health Service will interpret "Special Problems" as those peculiar to a certain state or states, as distinct from those which are general and nation-wide. "Financial Need" will be interpreted as the need of a state measured by the ability to finance its own public health work.

After allotments have been awarded to the states, the Surgeon-General will make regulations for payment. The state must submit a plan for organization of the state and local organizations, together with a budget. Federal money cannot be used to replace existing state or local expenditures. Each state must match, dollar for dollar, that part of the allotment made on a population basis. The state may use existing expenditures to match one-half of the allot-

ment, but the second half must be matched by new funds. The amount matched by old money must be replaced at the rate of 10 per cent per year with new funds, so that, at the end of ten years, all Federal money will be matched by new money. The allotment for "Special Needs" will be on the same basis. Allotments for "training of personnel" and "financial needs" need not be matched.

One million dollars will be available for the training of personnel. The need for qualified workers in local organizations is felt to be the most urgent problem. It is suggested that, to meet this need, certain institutions will be selected to act as "regional training centres", each to serve one or more states. At these centres will be given short courses, lasting from three to four months. To supplement this instruction, each state will likely set up a demonstration area where practical experience in the field and in the organization of that particular state may be secured.

What is aimed at is orderly and progressive expansion, which requires assurance of financial support. It is doubtful if the full allotment can be spent in the first few years. To date, uncertainty as to sources of funds has held back the development of local public health work more than anything else. This new legislation is looked upon as being permanent. Congress may, of course, change the amounts, but it looks as if the United States Public Health Service will have ten million dollars of new money to spend. In addition, there will be other millions for maternal and child health, via the Children's Bureau of the Department of Labour.

Grants-in-aid are an accepted practice in the British Isles where so much has been done to promote a high minimum of public health throughout the country. With the United States following along the same road, it does not seem likely that Canada will be long in doing likewise. To do so presumes a Department of National Health capable of and willing to give leadership.

G. F.

Editorial Comments

THE ANNUAL CONVENTION

Canadian Medical Association

June 22nd. to 26th.

THOSE of us who have been hibernating at various temperatures from zero to fifty or so below, and this includes the most of us, will not find amiss a little mental suggestion. It is not too early to plan for the Annual Meeting and for a visit to Victoria, British Columbia, the only city in Canada where it is summer all the year round! Think of golf—six courses, all open to visitors on payment of green fees; think of fishing—for grilse, salmon, steelhead, trout and black bass; think of hunting, for bear, cougar, wolf, deer, duck, geese, snipe, pheasant, and quail; think of motoring over a thousand miles of splendid roads amid gorgeous scenery; think of beautiful flowers and gigantic trees; think of delightful hospitality. Everything conspires to draw one to the Pacific Coast this year.

The Honourable T. D. Patullo, Premier of British Columbia, writes:

"I understand that the Canadian Medical Association is likely to meet in the City of Victoria. May I, on behalf of the Government, say how pleased we would be if the attendance could be as large as possible.

"I am sure that the people of the City of Victoria, as well as the public generally, will give you a most cordial welcome."

We are sure of our welcome; Dr. Hermann Robertson, the President-elect, with his committees, has been actively at work for months; Dame Nature has done her best. It is for our membership to measure up to the great opportunity. It is the hope of the Officers that all the Sections of our Association will be represented and that an abundance of good papers will be offered to the Program Committee. Get busy now.

ON TO VICTORIA!

Regulations in Ontario for the Control of Tuberculosis among Nurses in Sanatoria and Public Hospitals

During the past five years numerous papers have been published in America and in Europe directing attention to the number of tuberculous infections occurring in nurses and interns in general hospitals. Geer, in 1932, reported on the findings in a county hospital of 975 beds of which 215 were for tuberculous patients. Of the nurses' three years in training, approximately four months was spent in the tuberculosis wards. In eight years 4.5 per cent of the nurses had broken down with tuberculosis, either during training or shortly afterward. Only 30 per cent of the student nurses reacted to tuberculin on admission, but practically all showed a positive cutaneous reaction before completing training.

Ross, in 1930, in this *Journal*¹ reported that of 60 nurses admitted to sanatorium in Manitoba in a five-year period, 50 had broken down during their training or within one year of graduation. He estimated this as 1 in 17 of the nurses in training in Manitoba during the same period.

In 1933 McGhie and Brink made a survey of tuberculosis in the mental hospitals of the Province of Ontario and pointed out that on entering the school less than 50 per cent of the nurses in training reacted to tuberculin, while of the nurses in the age group 25 to 29 over 90 per cent were reactors. In their paper certain recommendations were made. As a result of this and other studies there was issued in July, 1933, by the Ontario Government "Regulations

1. Ross, E. L.: Tuberculosis in nurses, *Canad. M. Ass. J.*, 1930, 22: 347.

respecting X-Ray Examination and Tuberculin Test for Nurses in Sanatoria and Public Hospitals" (Pursuant to the Public Health Act, R.S.O., 1927, Ch. 262, Sec. 6, Clause A). Under the provisions of these Regulations all public hospitals and sanatoria in Ontario must apply the tuberculin test to all nurses within one month after entering the employ of the hospital, and those who react must have an x-ray examination of the lungs. The non-reactors must be examined again each year while in the employ of the hospital.

No nurse in training shall be allowed to care for a known or suspected case of tuberculosis until she has received instruction in the technique of protecting herself from infection. Records must be kept of all tuberculin and x-ray examinations and be available for inspection by the Department. Instructions which have been issued for the tuberculin test read as follows.

"The use of the standardized tuberculin prepared by the Connaught Laboratories, University of Toronto, is recommended.

For this test, the intracutaneous method shall be employed. The technique of the method is in all respects similar to that used in the Schick test.

One-tenth of 1 c.c. containing 0.01 mg. of tuberculin shall be given. A 1 c.c. syringe graduated in tenths, with needle gauge 26, length 5/16th of an inch, is advised.

The injection should be made on the flexor surface of the forearm, about three inches below the elbow. The skin should first be cleansed with 95 per cent alcohol. Then the needle is inserted intradermally and 0.1 c.c. of the tuberculin dilution injected. If done correctly a small white bleb will rise over the needle point. Great care should be taken that the tuberculin is not injected subcutaneously, in which event no local reaction will be seen and the value of the test is lost.

The test should be read between 36 and 48 hours.

A positive reaction consists of swelling (induration) and redness of 5 mm. (roughly 1/4 inch) or over in diameter. A doubtful reaction should be considered as positive (see regulations).

A positive reaction means only that infection with the tubercle bacillus has occurred at some time and does not imply that tuberculous disease is present.

When reading the tuberculin test, the arm should be in a good light and flexed a little at the elbow.

Any superintendent of hospital or sanatorium who desires to conduct the tuberculin test according to any method other than the one outlined above, may submit his method to the Division of Tuberculosis Prevention, Ontario Department of Health for approval."

This examination on entrance and yearly thereafter should result in the discovery of early or unsuspected cases of tuberculous infection in the nursing staff and should lessen the incidence of clinical tuberculosis, not only among the nurses in training but in those who so frequently develop the disease shortly after leaving the training school.

J. H. ELLIOTT

Report of the Department of Health of Montreal, 1934

Dr. S. Boucher, Director of the Department of Health has presented his usual valuable report. Expenditures for the year were at the rate of 63 cents per caput. It is to the credit of the responsible authorities that no reduction has been made, because Montreal's expenditures on public health have not been what they should be to attain the best results.

The birth rate has fallen steadily, and for 1934 it was 21 per 1,000 of population, whereas the average for the ten preceding years was over 26. A marked reduction in mortality to 10 per 1,000, as compared with 13, the average of the previous ten years, is not sufficient to offset the decline in births as shown by a definite reduction in the natural increase of the population or the excess of births over deaths.

An infant mortality rate of 90 per 1,000 living births is 50 less than it was ten years ago. Deaths from diarrhoea are just about one-third of what they were in 1924. Tuberculosis also shows a satisfactory decline. While these rates are relatively high, as compared with many other large cities, they nevertheless show good results for the money spent during recent years.

An interesting summary is given regarding amœbic dysentery in Montreal, with an account of the action taken by the Department. The Department conducts five pre-natal clinics; 42 well-baby clinics are operated and 33 others subsidized, with over 20,000 babies and 10,000 children of pre-school age registered for health supervision. Approximately 150,000 children in 290 schools are also kept under supervision, with regular examinations. Deaths during school years are never numerous, and a decline of 40 per cent since 1919 is remarkable progress. A substantial decrease in the percentage of most defects is recorded, including malnutrition. This is particularly satisfactory in view of economic conditions, and speaks well for unemployment relief measures. Examination privileges are being extended to the teaching staffs.

Well over 90,000 children have been immunized against diphtheria, and a satisfactory reduction in diphtheria deaths has followed. All milk comes from tuberculin-tested cattle. The tables which analyze diseases and deaths by age, race, time of occurrence, and so forth, give a very clear picture of existing conditions.

All told, the report is most complete and detailed, and it reflects great credit on Doctor Boucher.

G.F.

Special Articles

THE ETHICS OF MEDICAL PRACTICE

By DAVID A. STEWART, M.D., LL.D.

*Chairman of the Committee on Ethics, C.M.A.,
Ninette, Man.*

I. SHOULD THE CODE BE REVISED?

For some reason the Council at the Atlantic City meeting had one of its occasional twinges of conscience about the Code of Ethics of our profession, and decreed that it should be revised or re-written. That does not mean necessarily that a howl had been raised in our ranks about it, for few of us ever read it or even know it exists. Some adventurous person must have dug up the thing and actually read it, and raised the alarm, or the laugh. Now, while the iconoclasts are busy code-breaking and code-making, it has been considered fitting that this matter of our Code should be brought before the profession in two or three special articles, to make of them, in a way, an informal committee behind a committee.

None who have studied the Code will consider that the Committee is breaking into a Holy of Holies and laying violent hands on an Ark of the Covenant. Though it is all we have, the Code can never have been considered all we should have. It is by no means sacrosanct, and wears no halo like the Oath of Hippocrates or the Prayer of Maimonides. It was written, Dr. George S. Young tells me, by an extraordinary physician named Percival who practised a century or more ago in Manchester. I had suspected some pioneer brother-American, quite sure of himself, of the age of gigs and saddle-bags. It is really not so bad at all, with all its defects, though wordy and given unduly to exhortation. But it belongs definitely to its own age of gigs and saddle-bags and cannot envision such modern phases of practice as 'phone, auto or aeroplane, specialism, group practice, hospital practice, Public Health, state welfare responsibilities, state unemployment relief, medical societies, medical journalism, the laboratory, or the great irruption of science during the past half century.

A few years ago a pruning Committee brought in recommendations about verbiage. but so far I have not seen the Code reprinted as advised, so the final word must have been "Woodman, spare that tree". Our fellow-Americans grew up under the same Code, but have recently put telephones and some modern conveniences into the old structure. Percival no doubt wrote for English medicine, but the

British Medical Association is now satisfied with a few remarks on ethics scattered in their "Rules and Regulations", another unwritten constitution. Should our Code be patched up with modern gadgets or rebuilt?

The case against the Code as it stands has been well stated by one of the wisest of our leaders: "I have no ideas as to the form the new Code should be moulded into, but here are some of the criticisms of the one we are supposed to live by now. It is said to be too long, and might easily be condensed without losing anything essential. Though a quaint bit of writing, its phraseology is stilted and it is too ancient (or not ancient enough) to be respected. It does not state in sufficient detail what is considered unethical; there are new tricks that the old Code is not wise to, and it does not make clear the very real distinction between medical etiquette and medical ethics. Perhaps the most common comment is that while old truths are always truths they should be restated from time to time in modern language and to suit changing conditions." It would seem from the above wise comment that the need is, new lock, new stock and new barrel.

The Code has impressed me as putting very little pressure upon a doctor to enquire into his own professional competence or incompetence. It prescribes elaborate Alphonse and Gaston manners for doctor's behaviour to doctor, but does not prick the doctor's conscience to keep him up-to-date, and either give the poor trusting patient an adequate standard of service for his money—or his life—or let him go to some fellow-practitioner who can. In truth the position of the doctor who is not the best available in his line of work, and knows it, can be uncomfortable. At any rate the Code recognizes no differences in fitness. The most inadequate antiquated and stupid service that can shelter itself behind a doctor's diploma, if it is otherwise mannerly and right in its relations with other doctors, would get by. Our ethical standards need re-statement in this phase in the spirit of Bacon's fine saying, "The greatest trust between man and man is the trust of giving counsel."

Quite naturally in a Code of a century ago hospitals and hospital practice are not considered. Hospitals before Lister and Nightingale were refuges for homeless paupers in their extremities of illness, to be avoided as the plague if a man had any shelter of his own. Hospitals since Lister and Nightingale have come to be skilled and specialized centres with the utmost in care for the ill of all classes. It was safer to be sick outside the old hospitals

than in them; and it is safer to be sick in the new hospitals than outside them: hence the phenomenal rise of the modern hospital. As they have grown and multiplied these gathering places of all illnesses and working places of all physicians have been gradually shifting from church and charity foundations to community and state foundations. No wonder that there should be a maze of questions about ethical relations, relations of doctor to doctor within hospitals, paid staffs, unpaid staffs, consultants, free services to God's poor, the State's poor and often, it may be suspected, to some not poor at all. There are relations also to advisory boards and lay boards who may find it hard to distinguish between service and exploitation. Anyway, here is a new and modern chapter in the ethics of medical relationships, yet to be written.

Still another uncovered phase of modern practice is the new way of practice in groups. The Ontario Association last year suggested that the clause about advertising be extended to put emphasis on groups, and be made to read as follows. "It is derogatory to the dignity of the profession *at all times, whether practising singly or in groups or clinics*, to resort to public advertisements".

One common misconception of the Code is that it is a kind of statute law by which we may all be haled into medical courts and disciplined. It is more like the Bible in the church than the Blackstone in the court. It should be a persuasive Sermon on the Mount, rather than a thundering from Sinai. It aims at ideals, not laws; to form good conduct, not to punish what is bad. It fosters what might be called the personal religion of men of our craft. At the same time, what courts of discipline we have must turn again and again to the Code for official definitions, whatever they may lack in clearness, as to what is and what is not ethical conduct.

The lack in the old Code is not that it is old. The Oath is as old as the Father of Medicine, yet as new as the needs of the latest fledgling graduate. The fact is that even for its own day it had too much of the ways and means, and too little of the everlasting principles about it. We do not need new principles for old. The Code is in the repair shop, not because the Golden Rule has been superseded, but because phone and auto demand new applications of it. The first definite problem presented to the new committee concerned radio advertising. Clearly this lies outside the prescriptions of Hippocrates, though not beyond the enduring principles of his ethics. For our oft stupidity and dullness of spiritual preception, for our selfishness and our strong temptations, and for the complexity of our problems, however ethically we may wish to deal with

them, we need some plain rules of conduct. But much more we need ideals beyond all rules, torches to raise high.

With this in mind, I would like to see the new Code include—or at least be trimmed by—a kind of anthology of the spirit of ideal medicine, such as the familiar classics already referred to. The Sermon on the Mount and Paul's chapter on charity might not be overlooked, and to the Golden Rule belongs a place of honour on the front page. Other riches we might gather from our own medical lore,—say, Saint Benedict, "The care of the sick is to be placed above and before every other duty, as if, indeed, Christ were being directly served in waiting on them". Or Cassiodorus, "I insist, brothers, that those who treat the health of the bodies of the brethren who have come into the sacred places from the world should fulfil their duties with exemplary piety". Or Ambrose Paré, "Let him be tender with the sick, honourable to men of his profession". What better motto for an archway of a medical arts building! Or Sir Thomas Browne, "Though a cup of water from some hand may not be without its reward, yet stick not thou for Wine and Oil for the wounds of the Distressed".

SOME PERSONAL IMPRESSIONS OF THE BRITISH MEDICAL ASSOCIATION WORLD TOUR

By ROBERT DAWSON RUDOLF,

Toronto

As delegate of the Canadian Medical Association to the Melbourne Meeting of the British Medical Association of 1935 at Melbourne I have been asked by our Editor to give some personal impressions of the tour.

The members from the British Isles, to the number of about 300 (including wives and relatives), left England in two parties; one from Liverpool in the C.P.R. S.S. *Duchess of Richmond*, and the other from Southampton in the Cunard boat *Georgic*. The former travelled across Canada and joined the S.S. *Aorangi* at Vancouver; the latter, with which the writer travelled, crossed the States and boarded her at San Francisco. From that port the united party sailed on August 14th for Honolulu. Thence on to Fiji, Auckland, Sydney, and finally Melbourne, the goal of our outward journey.

At Suva, Fiji, we saw the fire-walkers' performance, a description of which appears in the *British Medical Journal* of December 28th last. All morning a fire had been burning at the bottom of a shallow pit, in which were a number of large stones and on top of them a layer of logs of wood. At a signal these logs were pulled aside amidst the yells of a crowd

of excited natives, and a glowing mass remained. In this were the stones which were now turned over so as to expose their hottest surfaces. Then bedecked natives walked slowly over these stones, up and down, and apparently in no hurry. Two members of the party (Sir James Purves-Stewart and Professor Waterston) were appointed to study the feat and to search for an explanation of the phenomenon, and I see that they differ in their explanations. The former thinks it a psychic phenomenon—a transient therm-anæsthesia of the soles due mainly to suggestion, either auto-suggestion by the performers themselves or hetero-suggestion by the chief or priest or some other authority. On the other hand, Professor Waterston believes that by training and practice and by repeated exposure of the soles to heat the performers are able to endure without severe pain a temperature which to an untrained person is intolerable. Similar fire-walking was done by a native of India last November in London before a learned society, and expert observers found that the temperature of the soles of the feet was not raised by the process nor was a piece of sticking-plaster placed on one of the soles charred at all. Personally, I believe that there is some trickery about it all, although what that is I cannot say, any more than one can explain many juggling tricks.

When at Auckland, N.Z., we travelled some 180 miles by train through a smiling agricultural country to Rotorua and there saw the Hot Springs and went through the nearby native village. The Maori natives of it use no fire, but do all their cooking, etc., in the springs. These are volcanic in origin and the water smells strongly of sulphur. It varies in temperature in the different springs, from lukewarm to boiling, and we saw pots boiling in one and at another place close by children revelling in the warm water of a pool supplied from a more temperate spring. A cold river runs past the village, and it is possible here for an angler to catch a trout and to cook it without moving or taking the fish off the hook.

At Sydney I left the ship and went by train to Canberra, the Australian Capital, where I was due to give the Charles Mackay lecture at the Australian Institute of Anatomy. This lectureship was founded to perpetuate the memory of Charles Mackay, who was a pioneer in Australian education. After the lecture I had the honour of lunching with the Governor-General, Sir Isaac Isaacs, at Government House. He is well into the "eighties" but full of activity, and later in the week he gave an admirable address of welcome to the British Medical Association at Melbourne.

It was, of course, Spring in Australia, but, although chilly, the sun was bright and at Canberra there was a wonderful display of

flowering shrubs, especially Japanese peaches. Then on by train to Melbourne, where I was in time to greet the party who had come on by sea in the *S.S. Aorangi*. The next five days at Melbourne was a whirl of meetings and all sorts of social functions. The Australians outdid themselves in hospitality, and I am afraid that we suffered from a surfeit of meat and drink and a paucity of sleep which made many of us almost glad to escape to sea again before being killed with kindness.

Of course it was impossible for one to attend more than a small proportion of the meetings. Personally, I saw most of the work in the Sections of Medicine and of Pharmacology and Therapeutics, the former being presided over by Lord Horder and the latter by Sir William Willecox.

In the Section of Medicine the first discussion was on "Obesity", opened by Professor Lambie, of Sydney, who reviewed the latest opinions about the etiology and the metabolism of the condition. He doubted if it were right to assume that weight should increase with age, and emphasized the importance of heredity as a cause of over-weight; 70 per cent of the obese had such a history. While it was reasonable to assume that obesity would occur whenever there was a long-continued excess of intake over output of energy the question was more complicated than this. There was often present a disturbance of liver function, glycogen being laid down and carbohydrate being converted into fat with excessive ease. Dr. J. H. Anderson said that the first step in treatment was to distinguish the type of obesity—exogenous, endogenous, or mixed. The rational line to take in the former was to reduce the food and increase the exercise. Drugs found their special use in the endogenous type. They, especially thyroid extract, should be controlled by estimating the metabolic rate and the tolerance for sugar and by keeping a watch on the pulse rate. One-quarter to $\frac{1}{2}$ of a grain of thyroid extract was of great use even in exogenous obesity. The discussion was continued by Dr. E. H. Stockes, Sir James Purves-Stewart and others.

Dr. A. Clarke Begg opened a discussion on "Diabetic Gangrene". He pointed out that the condition was increasing owing to the longer life conferred on diabetics, by insulin, allowing arteriosclerosis to develop. It was probable that disordered fat metabolism, associated with an excess of cholesterol in the blood, was the most important factor in causing diabetic arteriosclerosis. He said that arteriosclerosis and consequent gangrene was the principal risk in diabetes nowadays. Many took part in the discussion of the treatment of the gangrene.

The second Session of the Section of Medicine was devoted chiefly to a consideration of

the "Severe Anæmias". Dr. J. C. Matthews opened the discussion. It was now recognized that liver preparations were only effective in megalocytic anæmias, while iron was of undoubted value in idiopathic hypochromic and other microcytic anæmias. Large doses of iron were required, but nothing was gained by prescribing organic preparations of hydrochloric acid. Dr. J. H. Anderson pointed out that failure to absorb the anti-anæmic factor in the bowel sometimes rendered all medication *per os* useless and treatment here must be by injection. Dr. C. T. C. de Crespigny called attention to a type of megalocytic anæmia which was resistant to liver therapy. It might be very chronic and was only susceptible, and that only temporarily, to improvement by transfusion. Dr. Ian Wood discussed the damage to vital organs from severe anæmia, especially from traumatic blood loss. He had found that if the blood hæmoglobin remained for long below 20 per cent renal failure set in. Dr. Ian Wood and others urged the use of Eve's halometer in determining megalocytosis. If this were revealed then a further investigation of blood and gastric secretion should be made.

Dr. Crichton Bramwell then read a paper on "Gallop Rhythm and the Accentuation of the Physiological Third Sound of the Heart". He emphasized the importance of distinguishing presystolic from protodiastolic gallop, since the former was serious and the latter was compatible with perfect health. In a series of 63 cases in a consecutive series of 1,353 cardiac patients only 15 lived for more than 18 months after the gallop was first noticed.

On the last day the Sections of Medicine and of Surgery combined to discuss the subject of "Thyrotoxicosis". Lord Horder opened by a comprehensive review of our present knowledge of the condition. The cause of exophthalmic goitre was unknown, although certain etiological factors were emerging. "Whether the flaw concerned the involuntary nervous system, the psyche, the endocrine balance, or some other part of the body was hidden." If modification of the patient's life did not ameliorate the symptoms there should be absolute rest in bed for three months. Iodine, bromides and belladonna were of some use. When the disease remained active after six months of carefully supervised medical treatment, partial thyroidectomy should be undertaken. Sir Thomas Dunhill gave the surgical view of the condition. He said that while medical treatment was seldom satisfactory in children it was best to control the condition as long as possible with the smallest amount of intervention. Several Australasian medical men continued the discussion. Apparently the disease is extremely common in Australia and New Zealand, the latter having a higher death rate from it than any other British

country. They leaned strongly to surgical treatment, Dr. A. W. H. á Court, of Sydney, saying that "the rôle of the physician should be to prepare the patient for operation and to subsequently supervise a follow-up for at least two years", and Dr. H. H. Turnbull, of Melbourne, asserting that "the rôle of the physician was confined to diagnosis." Lord Horder, winding up the discussion, said "He could not understand Dr. Turnbull when he declared that the surgeon should have the sole right of deciding the time for operation; though he agreed that the more advanced the case the better the surgical results." He concluded by saying, "Use the operation too early if you wish to do thyroidectomy a disservice." Sir Thomas Dunhill, in concluding, said that x-ray was of some service in young patients, but as regards adults "of 140 patients irradiated 118 had established auricular fibrillation following 'cure' by this means."

A short discussion on "Hæmolytic Jaundice" concluded the program of the Medical Section. Dr. S. O. Cowen urged the curative value of splenectomy in familial acholuric jaundice, and gave a series of cases illustrating that the cure was permanent.

In the Section of Pharmacology and Therapeutics, Sir William Willecox, the President, opened a discussion on "Hypnotic Drugs". He specially drew attention to the possible dangers of the barbiturates and gave examples of where even medicinal doses had been followed by fatal pneumonia. His evidence was not, at least to me, convincing, the *post hoc ergo propter hoc* fallacy being a possible explanation of these rare cases.

A discussion on "Urinary Antiseptics" followed, opened by Mr. J. Thompson Tait. Hexamine was one of the most effective, and in most cases the urine was sufficiently acid to permit of the liberation of formaldehyde. The value of hexyl-resorcinol was no greater and it might disturb the digestion. In *bacillus coli* infection of the urinary tract thorough alkalization of the urine was effective in the early stages, especially when used along with a ketogenic diet. Mr. H. Mortensen said that an ideal urinary antiseptic had yet to be discovered. Ammonium benzoate had a higher acidifying action on the urine than had acid sodium phosphate. In closing the discussion, Sir William said that it was important to change the antiseptic used often. In England they were using a combination of hexamine and methylene blue, which frequently gave better results than either of the drugs used alone.

Next day there was a discussion on "Pre-medication", introduced by Dr. F. W. Green. This means the use of sedative drugs before the administration of a general anæsthetic. For many years it had been common to give morphia

before an anæsthetic, but recently it has been largely replaced by chloretone, the barbiturates, sodium amytal and nembutal. Drugs given *per rectum* have a more prolonged action than by the mouth, which was here an advantage. Paraldehyde and avertin are those usually so employed. Avertin appears to be the most suitable, provided that the dose be small. This should be from 0.05 to 0.1 g. per kilo of body weight. Premedication by the venous route should never be done. Much difference of opinion was shown by various speakers in the discussion as to the relative value of these drugs for this purpose, some even asking if premedication were necessary at all. Then followed discussions on "Gas Anæsthesia under Positive Pressure" and on "Spinal Anæsthesia". I was unable to wait for these, so say nothing about them.

After the meeting the party split in two, one-half travelling by the *S.S. New Zealand* via Bali and Java, and the other in the *S.S. Marella* via Brisbane, Thursday Island and Java; and both converged on Singapore after trips lasting nearly a month. I went on the *S.S. Marella* and afterwards there was much friendly discussion as to which group had scored. Personally, I think we did!

Thursday Island is the centre of the pearl-fishing in this part of the world. It seems that the divers, who are mostly Japs, get paid for all the mother-of-pearl that they bring up, but are allowed to keep the pearls as a perquisite. This occasionally means a fortune for a few lucky ones. Their life is a risky one and likely to be short, although they are not afraid of the sharks that infest these seas. They find that they can easily scare them away by letting out a jet of air from the helmet. But the divers who work in shallow water and have no costumes often fall victims to these voracious fish.

We missed Bali, but the other party spent a day there and saw amongst other interesting sights a funeral and cremation ceremony. The simple inhabitants, Hindoos, are as yet almost untainted by civilization. They believe that after death they pass through various stages of purgatory and eventually attain heaven, which for them is their beloved Bali again. The Dutch,

who are the owners of the island, allow no missionaries there.

The few days we spent at Singapore were very interesting. The medical school and the hospitals are of a very high order and the degree is recognized by the British Medical Council. Then on board the *P. & O. S.S. Rajputana* for the last long lap of our journey to England. There was some question about our being allowed through the Suez Canal, but this was smoothed out. After a glimpse at Colombo and Bombay, we spent a day at Aden, where there was considerable naval activity, and an imposing array of war-ships and planes. In the Red Sea and in the Canal we passed several Italian transports full of troops. They were on their way out and seemed full of high spirits, but one could not help wondering how they would look after a few months' campaigning in Abyssinia. At Marseilles many of the party left the ship to travel across France by train or air, and a further lot deserted us at Plymouth, so it was a much depleted crowd that steamed up the Thames in a cold rain and then parted at King George Vth Dock.

The tour was a very delightful one. Many well-known medical authorities were with it, but it was interesting to note that not a word of "shop" was talked the whole voyage; except, of course, at Melbourne, where we had ample. Great minds unbent and only concentrated on deck quoits, shuffle-board, chess and such games. At every port we were welcomed by the local members of the British Medical Association, and were shown whatever there was of interest.

One could not but be struck with the immense value of such a trip, not only as a means of bringing more closely together the profession, but, in a larger way, in helping to weld together the far-flung parts of the British Empire. And as I watched from the deck of the *C.P.R. S.S. Montclare* the last short lap of the journey lessening, pleasant memories of many lands, many climates and many peoples rose in my mind. But the longer I thought, the clearer the feeling grew, and the more I became convinced that (to alter the saying about dogs) the more one sees of other countries the more one thinks of Canada.

Oh, what is more delightful than to lay one's cares aside, when the mind puts aside its burden, and we return to our beloved home wearied by distant travel, and rest our limbs on the wished-for bed? This, this alone, repays us for our grievous toil.—Catullus.

There is nothing in the whole world that abides. All things are in a state of ebb and flow, and every shadow passes away. Even time itself, like a river, is constantly gliding away.—Ovid.

When to the sessions of sweet, silent thought
I summon up remembrance of things past,
I sigh the lack of many a thing I sought,
And with old woes new wail my dear time's waste:
Then can I drown an eye, unus'd to flow,
For precious friends hid in death's dateless night,
And weep afresh love's long-since cancelled woe,
And moan the expence of many a vanish'd sight.
—Shakespeare, 30th Sonnet.

Men and Books

HISTORY OF THE CANADIAN MEDICAL ASSOCIATION, 1867-1921*

H. E. MACDERMOT,

A REVIEW BY W. B. HOWELL,

Montreal

The medical profession of Canada is fortunate in the books which have been written on its history. It owes no small debt of gratitude to M.-J. and George Ahern for their *Notes pour servir à l'histoire de la médecine dans le Bas-Canada*; to W. Canniff who, in his *Medical Profession of Upper Canada* did for Ontario what the Aherns did for the Province of Quebec; to J. J. Heagerty for his *Four Centuries of Medical History in Canada*; and to Dr. Maude E. Abbott for her *History of Medicine in the Province of Quebec*. Now we have another book added to this series: Dr. H. E. MacDermot's recently published *History of the Canadian Medical Association*. Dr. MacDermot's book is more than a history of the Canadian Medical Association; it is, to a considerable extent, a history of the medical profession in Canada from the middle of the 19th century to the present time.

The author traces the origin of the movement which was to result in the formation of the Canadian Medical Association to Dr. Joseph Painchaud and some other Quebec physicians who in 1844 planned a "Medical Fund or Association" for the purpose of affording relief to physicians who were in distress, and after their death to their widows and orphans. Painchaud's scheme was taken up by the medical societies in other parts of Canada. Its charitable purpose dropped out of sight in the desire to form an association in the interests of the profession as a whole. There is no doubt that those interests needed guarding for Upper and Lower Canada were full of unlicensed practitioners and quacks. This first movement came to nothing, as did another in 1849, owing to the inability of a few to agree and the indifference of the many. It was not until the year of Confederation that the Canadian Medical Association was born, and its birthplace was, suitably enough, the city of Quebec.

From the first the Association concerned itself with matters which were of importance, not only to the medical profession of Canada but to the general public as well. An attempt was made

as early as 1868 to get a bill passed by the Dominion Parliament setting up a general council of medical education and registration for Canada. It was more than forty years afterwards that the bill became a law.

At the first meetings there was much ado about homœopaths. Dr. William Clarke, the president of the Medical Council of Ontario, had difficulty in being elected a member of the Canadian Medical Association. He was suspected of consulting with homœopaths, a crime which he indignantly denied. "I utterly repudiate and abhor them," he said at a meeting shortly after he was elected. On another occasion the delegate from the County of Brant Medical Society said that his society not only refused to admit to its membership anyone who consulted with a homœopath, but also anyone who consulted with anyone who consulted with a homœopath.

In the early 'eighties all but a very few medical men in Canada were general practitioners, and the first attempts at specialism were looked upon with great disfavour. It was even proposed at a meeting of the Association that "specialists should be treated and looked upon as irregular practitioners". The Association, however concerned itself for the most part with subjects more important than homœopaths and specialists. There was, in the early days, as there is today, an earnest sense of responsibility to the people of Canada, and efforts were constantly being made to arouse the government to appreciate the importance of legislation in matters of public health.

The existence of the Association for twenty-five years was precarious. That it did not die was due to a small number of men who were interested in the advance of medical science and looked upon their profession as something more than a means to make a livelihood. They had many difficulties to face, the greatest being the indifference of their colleagues. At the annual meeting in 1891 the attendance was so small that it was proposed to hold the meetings every third year instead of annually. In 1894 there was a notice of motion for the disbanding of the Association. Much credit for tiding it over these bad times was due to successive general secretaries.

The *Journal* of the Association is a continuation of the *Montreal Medical Journal* which was taken over, lock, stock, and barrel, in 1911, and given a new name. Dr. MacDermot pays a well-deserved tribute to the memory of Dr. A. D. Blackader, who in 1919, when over seventy years of age, succeeded Sir Andrew Macphail as editor. In 1921 the Association was reorganized.

* History of the Canadian Medical Association, 1867-1921. H. E. MacDermot, M.D., F.R.C.P.(C.). 209 pages, illustrated. Price \$3.00. Published by Canadian Medical Association, 184 College Street, Toronto, 1935.

funds were raised by a bond issue, and a permanent general secretary, Dr. T. C. Routley, was appointed. Since then it has flourished exceedingly, not only to the benefit of the medical profession in Canada but to that of the general public.

One of the most interesting chapters in this excellent book is that on "The early medical journals of Canada". Only those who have delved in Canada's medical past can appreciate the great amount of labour this chapter must have cost the author. Much of the difficulty of investigating the life history of journals now extinct is due to the habit they had of changing their names. One of them had six aliases in nine years! Dr. MacDermot quotes freely from the old journals. Some of the quotations are not only instructive but amusing. In early Victorian times editors were less willing than they are now to live and let live. They attacked one another in their editorials with an acrimony to which we are unaccustomed. The *Upper Canada Medical Journal*, for instance, accused Dr. Archibald Hall, editor of the *British American Journal*, of "symptoms of premature decay—symptoms of a melancholy character—whose chief peculiarity is a spirit of frowardness, generally considered pathognomic of cerebral disturbances of approaching dissolution". To which Hall replied that he had "no objection to his young contemporary endeavouring to be witty, but on the contrary was pleased to observe it, as it was a contrast to his usual prosiness". The reeriminations of Canadian medical editors

remind one of those described in *Pickwick* as appearing in the columns of the *Eatanswill Gazette* and the *Eatanswill Independent*, the mutual fulminations of Messrs. Slurk and Pott. The editor of the *Medical and Physical Journal*, for instance, was accused by a rival of "clap trap cant".

Dr. MacDermot's book contains a number of charming sketches of prominent Canadian doctors who were living in the middle of the last century, men who had begun their medical careers as apprentices, who knew what it was to operate without anaesthetics and without antiseptics, who knew no pathology or bacteriology, and who had worked through the terrible epidemics of cholera and typhus of the 'thirties and 'forties. They were ignorant of much that the youngest modern graduate in medicine knows, but what knowledge they had they applied to the best advantage. They had wide experience of disease, they understood their patients, and they knew how medicine should be practised.

Dr. MacDermot has made a valuable contribution to Canadian literature. Text-books are soon out of date and thrown away, but a reliable history becomes more and more interesting as time goes on. Future students of Canadian medical history will have cause to bless the name of MacDermot for providing them with a reference book which is completely reliable.

It only remains to say that this book is illustrated with some excellent photographs.

Association Notes

Proceedings of the Executive Committee on October 31, 1935

Continued

FEDERATION

The General Secretary gave a brief outline of the trip across Canada recently made by the President and himself. With regard to the question of federation, the following information was given to the Executive Committee:—

Nova Scotia

Adopted a resolution, unanimously (as far as one could tell), favouring the proposal that the Association become the Canadian Medical Association, Nova Scotia Division.

Instructed that a strong committee be empowered to study the matter during the coming year; and

Accepted a notice of motion respecting By-Laws by which a consummation of federation may be had at the next annual meeting if the final report of the Committee is favourable and acceptable to the meeting.

Prince Edward Island

Action the same as Nova Scotia.

New Brunswick

Action the same as Nova Scotia.

Ontario

In Ontario, the proposal was endorsed in principle last year by the Board of Directors of the Ontario Medical Association and also at two largely attended meetings in Ottawa and Hamilton. The question will be fully gone into by the O.M.A. during the current year.

Manitoba

Endorsed in principle the proposal to become the C.M.A., Manitoba Division.

Instructed the incoming Executive Committee to study and report upon the proposal; and

Accepted Notice of Motion which would permit the Association to complete Federation at the next annual meeting, provided the report of the Executive Committee was favourable and acceptable to the Association.

Alberta

Notice of Motion having been given some time previously, the Alberta Medical Association was constitutionally enabled to take such complete action as it might desire to do in the matter.

The Association voted to become the C.M.A., Alberta Division, and requested the Alberta College of Physicians and Surgeons (who collect the fees in the Province both for the College and the Association) to add, beginning with 1936, the sum of eight dollars to the existing compulsory fee (which is \$10.00), whereby all practitioners in the Province would become fully paid-up C.M.A. members.

Subsequently, at the annual meeting of the College of Physicians and Surgeons, the request of the Association was approved and it would now appear that Alberta has gone all the way into Federation, becoming the C.M.A., Alberta Division, and further that the Division, by its compulsory fee, brings the entire medical profession of the Province into full C.M.A. membership.

British Columbia

Resolution (carried unanimously) favouring becoming C.M.A., British Columbia Division.

Executive Committee empowered to work out details.

Notice of Motion permits of By-Laws being amended at next annual meeting to give complete effect to Federation, providing Executive Committee report is favourable.

British Columbia now has compulsory fee of \$10.00 collected by the College of Physicians and Surgeons.

Saskatchewan

Resolution (carried unanimously) favours becoming C.M.A., Saskatchewan Division.

Board of Directors empowered to work out the plan in conjunction with parent body.

Notice of Motion accepted whereby, if report is favourable, Federation in Saskatchewan may be completed at the next annual meeting.

Quebec

The General Secretary reported that about a year ago the President and himself attended meetings at Montreal, Quebec, and Sherbrooke, at which time the principle of Federation was heartily endorsed by those present. Dr. Patch reported that the question was taken up at the annual meeting of the Province of Quebec Medical Association and the general opinion was that, until they have a concrete proposal from the Canadian Medical Association, no definite action will be taken by the provincial association.

Dr. Primrose took the chair and Dr. Young then presented a draft of the Constitution and By-Laws applicable to Divisions. This was very carefully considered by the Executive Committee, clause by clause, and was finally approved in the following form:—

CONSTITUTION AND BY-LAWS

APPLICABLE TO DIVISIONS

CONSTITUTION

ARTICLE I.—TITLE

This Association shall be known as The Canadian Medical Association, and, when the French language is used, it shall be known as "L'Association Médicale Canadienne".

ARTICLE II.—OBJECTS

1. The promotion of health and the prevention of disease.
2. The improvement of medical services however rendered.
3. The maintenance of the integrity and honour of the medical profession.
4. The performance of such other lawful things as are incidental or conducive to the welfare of the public and of the medical and allied professions.

ARTICLE III.—ETHICS

The Code of Ethics of The Association shall be such as may be adopted by The Association from time to time. A copy shall be supplied to all members of The Association.

ARTICLE IV.—MEMBERSHIP

The Association shall be composed of ordinary members, members-at-large, senior, non-resident and honorary members, elected by the method set forth in the By-Laws.

ARTICLE V.—BRANCH ASSOCIATIONS

Each provincial medical association is recognized as a Branch Association, and shall be represented on the General Council and on the Executive Committee of The Canadian Medical Association.

Any Branch, if it so desires, may merge its identity in that of The Canadian Medical Association and become a Division. It shall then be known as The Canadian Medical Association, (name of Province) Division. All of its members shall be members of The Canadian Medical Association and shall be entitled to all the rights and privileges of membership.

ARTICLE VI.—AFFILIATED SOCIETIES

Any nationally or internationally organized medical, scientific or sociological body may, subject to the approval of the General Council, become affiliated with The Canadian Medical Association. Affiliation shall be understood to imply the establishment of a friendly relationship with the affiliated organization. There shall be no obligation on the part of either party to the affiliation to sponsor policies or movements on the part of the other.

ARTICLE VII.—MEETINGS

The meetings of The Association shall be held in whole or in part on such occasions as may be provided for in the By-Laws.

ARTICLE VIII.—OFFICERS

(a) The Patron.

(b) The elective officers of The Association shall be a President, a President-Elect, a Chairman of the General Council, and an Honorary-Treasurer.

(c) The appointive officers of The Association shall be a General Secretary and such other officers as may be appointed by the Executive Committee.

ARTICLE IX.—THE GENERAL COUNCIL.

In so far as it relates to Divisions, the General Council shall consist of:—

- (a) The officers of The Association.
 - (b) The President and Secretary or Joint Secretaries of Divisions.
 - (c) Delegates elected by Divisions.
- Each Division shall be entitled to elect 5 delegates to serve on the General Council for its membership in The Canadian Medical Association of 50 or less; 1 additional delegate for its membership from 51 to 100; another delegate for its membership from 101 to 300; and, thereafter, one delegate for every 300 members above 300.
- (d) Chairmen and Secretaries of Committees of The Association.
 - (e) Chairmen and Secretaries of Sections of The Association.
 - (f) Past-Presidents of The Association.
 - (g) Two representatives of the Department of Pensions and National Health.

ARTICLE X.—COMMITTEES

The Committees shall be (a) Standing; (b) Special.

(a) The Executive Committee shall be elected by the General Council; the other Standing Committees shall be appointed by the Executive Committee.

The Standing Committees are as follows:—

1. The Executive Committee
2. The Committee on Legislation
3. The Committee on Medical Education
4. The Post-Graduate Committee
5. The Central Committee on Program.
6. The Committee on Constitution and By-Laws
7. The Committee on Archives
8. The Committee on Public Health
9. The Committee on Ethics and Credentials
10. The Committee on Economics
11. The Committee on Pharmacy
12. The Committee on Hospital Service
13. The Cancer Committee.

- (b) Special Committees may be appointed by—
- (i) the President
 - (ii) the General Council
 - (iii) the Executive Committee
 - (iv) the Chairman of the General Council.

ARTICLE XI.—FUNDS

Funds for the purpose of The Association shall be raised in such manner as may be determined by the General Council.

ARTICLE XII.—THE ASSOCIATION YEAR

The Association year shall be the calendar year.

ARTICLE XIII.—AMENDMENTS

1. Notice of Motion by individual members or others to amend the Constitution must be placed in the hands of the General Secretary six months before the date of the annual meeting.

2. Amendments may be proposed by the General Council, the Executive Committee or the Committee on Constitution and By-Laws, without notice of motion, but the proposed amendments shall be published in the *Journal* in two issues preceding the annual meeting.

3. The Constitution shall be amended by a two-thirds vote of the members of the General Council in session present and voting.

ARTICLE XIV.

No provision of the Constitution or By-Laws herein set forth shall interfere with the status of a Division as a provincial organization. As a provincial body, it shall have complete control of its own affairs.

BY-LAWS

CHAPTER I.—MEMBERSHIP

Section 1—Ordinary Members

Every member in good standing in a Division shall be an *ordinary member* of The Canadian Medical Association.

Section 2—Members-at-Large

Any graduate in medicine residing in any province of Canada, who is not a member of a Division, shall be accepted as a member of The Canadian Medical Association on written approval presented to the General Secretary from the Executive body of the Division in the province in which he (-she) resides. He (-she) shall be liable for the annual fee. Such members shall be designated *Members-at-Large*.

Section 3—Senior Members

Any member of The Association in good standing who has attained the age of seventy years is eligible to be nominated for senior membership by any ordinary member of The Association, but may be elected only by the unanimous approval of the members of the General Council in session present and voting. Not more than ten such senior members may be elected in any one year. Senior members shall enjoy all the rights and privileges of The Association, but shall not be required to pay any annual fee.

Section 4—Non-Resident Members

Non-resident members may be elected by the Executive Committee from regularly qualified practitioners residing outside of Canada. They shall be required to pay not more than seventy-five per cent of the annual fee.

Section 5—Honorary Members

Honorary members may be nominated by any member of The Association and shall be elected only by unanimous vote of the General Council in session present and voting. Not more than five honorary members may be elected in any one year and at no time shall the list of living honorary members exceed twenty-five. Honorary members shall enjoy all the rights and privileges of The Association, but shall not be required to pay an annual fee.

Section 6—Discipline of Members

Any member failing to conform to the Constitution and By-Laws and Code of Ethics shall be liable to censure, suspension or expulsion.

(a) Any member whose annual fee is directly payable to The Canadian Medical Association and whose annual fee has not been paid on or before the 31st of March of the current year, may, without prejudice to his (her) liability to The Association, be suspended from all privileges of membership.

(b) Any member who has been found guilty of unprofessional conduct may, upon representation of the facts to the General Council, be censured, suspended or expelled from The Canadian Medical Association.

Section 7—Restoration to Membership

A member, suspended or expelled, shall not be restored to membership until all arrears of fees (if directly payable to The Canadian Medical Association) have been paid, or until such requirements as may be determined by the General Council or the Executive Committee have been met.

Section 8—Resignation from Membership

Membership in The Association shall automatically cease only on suspension, expulsion or death. Resignation may be effected by giving notice in writing to the Secretary of the Division not less than one month before the beginning of the calendar year; or in the case of a member-at-large, by giving notice directly to the General Secretary of The Canadian Medical Association one month before the next annual fee is due.

Section 9—Registration at Meetings

No member shall take part in the proceedings of The Association or in the proceedings of any of the sections thereof until he (she) has properly registered.

CHAPTER II.—GUESTS AND VISITORS

Section 1—Visitors from outside of Canada

Medical practitioners and other men of science residing outside of Canada may attend the Annual Meeting as guests of the President or of the General Council, or as visitors when vouched for by the General Secretary. They shall register with the General Secretary without payment of fee and may, after proper introduction, be allowed to participate in discussions.

Section 2—Medical Students attending Meetings.

Any hospital intern or medical student, when properly vouched for, may be admitted as a visitor to the scientific meetings, but shall not be allowed to take part in any of the proceedings unless specially invited by the Committee on Program to present a communication.

Section 3—Delegates from Affiliated Societies at Scientific Meetings

Two delegates from each affiliated society, one of whom shall be a member of this Association, may attend the scientific meetings.

Section 4—Delegates from Affiliated Societies at Meetings of General Council

Two delegates from each affiliated society, provided one delegate is a member of this Association, may be invited by the Executive Committee to attend meetings of the General Council. They may, at the request of the Chairman, take part in the deliberations but shall have no voting power.

CHAPTER III.—ANNUAL MEETINGS

Section 1—Time and Place of Meetings

The time and place of meetings shall be decided by the General Council, and shall be announced as early as possible.

Section 2—Arrangements for Annual Meetings

When The Canadian Medical Association meets in any province where there is a Division, the meeting shall be held in conjunction with that of the Division. The local arrangements shall be under the direction of the Executive Committee of The Canadian Medical Association, which may enlist the assistance of the Division. The Canadian Medical Association assumes full control of the proceedings of the meeting and of all financial obligations, save entertainment.

Section 3—Type of Program

The program of the meeting may consist of business sessions, general, and sectional scientific sessions.

Section 4—Presiding Officer

The President or some person designated by him shall preside at all general meetings.

Section 5—Rules of Order

The Rules of Order which govern the proceedings of the House of Commons of Canada shall be the guide for conducting all meetings of The Association.

CHAPTER IV.—MEETINGS OF SECTIONS

Section 1—Sectional Scientific Sessions

The Executive Committee shall determine what scientific sections shall hold sessions at any annual meeting.

Section 2—Appointment of Sectional Officers

The Chairman and Secretary for each scientific section shall be appointed by the Executive Committee.

Section 3—Presiding Officers at Meetings of Sections

The Chairman of the Section, or some one designated by him, shall preside at all meetings of the Section.

Section 4—Duties of Secretaries of Sections

The Secretary of the Section shall keep a correct record of the transactions and shall transmit it to the General Secretary for insertion in a Minute Book provided for the purpose.

CHAPTER V.—OFFICERS AND EXECUTIVE COMMITTEE

Section 1—Appointment of Nominating Committee

The General Council, at the first session of the annual meeting, shall elect by ballot from among its members present a Nominating Committee of fifteen members, not including the President, who shall be *ex-officio* Chairman of the Committee.

Candidates for election to the Nominating Committee shall be named from the floor, and the list shall include the names of one or more members of each Branch or Division, if represented at this session; but a Division, through an accredited representative present, may officially place in nomination the name of one candidate.

The candidate in each province holding the highest vote of the candidates from that province shall be declared elected. The remaining members shall be declared elected by majority vote.

The election shall be decided on a single ballot. The Chairman of the General Council shall, if necessary, give the casting vote or votes.

Section 2—Duties of Nominating Committee

The Nominating Committee shall meet on the day of its election and submit to a later session of the General Council:—

1. Nominations of the following officers of The Association: a President-Elect, a Chairman of the General Council, and an Honorary-Treasurer.

2. Nomination of an Executive Committee which, in addition to those who are members *ex-officio* (See Chapter VII., Section 4), shall consist of thirteen members geographically distributed as follows:—Three shall be resident in each of the two provinces in which the offices of The Association are located and one in each of the other provinces.

At its session, the Nominating Committee may receive in writing a Division's official nomination of a candidate or candidates for the representation on the Executive Committee to which the Division is entitled. In the event of this official nomination(s) being rejected, in whole or in part, by the Nominating Committee, the reasons for such action shall be incorporated in its report to General Council.

3. *Rules of Procedure.*—The Committee shall be called to order by the President as Chairman *ex-officio* of the Committee. In the absence of the President, the General Secretary shall convene the Committee and request the Committee to select, by open vote, the Chairman. The Committee shall then proceed to carry out its duties by open vote. In case of a tie vote, the Chairman shall have the casting vote in addition to the vote to which he is entitled as a member of the Committee. When called for, the report of the Committee shall be presented to the General Council by the General Secretary.

Section 3—Election of Officers and Executive Committee and Place of Meeting.

When the report of the Nominating Committee has been received by the General Council in session other nominations may also be received from the floor. A ballot shall then be taken for each of the offices in turn and also for elective members of the Executive Committee, by provinces, in accordance with the By-Law for the guidance of the Nominating Committee, Chapter V., Section 2, paragraph 2.

CHAPTER VI.—DUTIES OF OFFICERS

Section 1—Duties of the President

The President shall preside at the general sessions of The Association and shall perform such duties as custom and parliamentary usage require. He shall deliver a presidential address. He shall be a member *ex-officio* of

all committees of The Association. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association.

Section 2—Duties of the President-Elect

The President-Elect shall be installed and shall assume the office of President at the first general session of the annual meeting next following his election to the office of President-Elect. He shall be a member *ex-officio* of all committees of The Association. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association.

Section 3—Duties of the Chairman of the General Council

The Chairman of the General Council shall preside at all meetings of the General Council. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association. He shall be a member *ex-officio* of all Committees and Chairman of the Executive Committee.

Section 4—Duties of the Honorary-Treasurer

The Honorary-Treasurer shall be the custodian of all moneys, securities, and deeds which are the property of The Association.

He shall pay by cheque only. Such cheques shall be countersigned by the Chairman of the General Council or other authorized officer of The Association, and shall be covered by voucher.

He shall prepare an annual financial statement audited by a chartered accountant.

He shall furnish a suitable bond for the faithful discharge of his duties. The cost of the bond shall be borne by The Association.

He may receive for his services an honorarium to be determined by the General Council. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association.

He shall be a member *ex-officio* of the Executive Committee.

Section 5—Duties of the General Secretary

The General Secretary shall be the Secretary also of the General Council and of the Executive Committee of The Association. He shall also be a member *ex-officio* of all Committees of The Association. He shall give due notice of the time and place of all annual and special general meetings, by publishing the same in the official *Journal* of The Association, or, if necessary by notice to each member. He shall keep the minutes of each meeting of the General Council and the Executive Committee in separate books, and shall provide minute books for the secretaries of the different sections, which he shall require to be properly attested by the secretaries thereof. He shall notify the officers and members of committees of their appointment and of their duties in connection therewith. He shall publish the official program of each annual meeting. He shall perform such other duties as may be required of him by the President, the General Council or the Executive Committee. All his legitimate travelling expenses shall be paid for him out of the funds of The Association, and he shall receive for his services a salary to be determined by the Executive Committee.

CHAPTER VII.—THE GENERAL COUNCIL

Section 1—Meetings of the General Council

The General Council shall meet for at least the first two days of the annual meeting of The Association and thereafter while The Association is in session, at the call of the Chairman. Before the close of the annual meeting it shall elect the officers and the Executive Committee and select the place for the next annual meeting, or, if advisable, for meetings up to three years in advance.

Section 2—Special Meetings of General Council

During the interval between annual meetings the General Council shall meet at the call of the Executive Committee. For all such meetings of the General Council, due notice shall be sent to each member, stating the purpose of the meeting. The Executive Committee, if it so

decides, instead of calling such meetings of the General Council, may refer important questions to the General Council and obtain its decision by means of a mail ballot. In the event of a mail ballot being taken, a two-thirds majority vote shall govern.

Section 3—Duties of the General Council

The General Council shall have supervision of all properties and of all financial affairs of The Association. It shall, through its officers, conduct all business and correspondence, and shall keep a record of all meetings and the receipt and expenditure of all funds, and shall report upon same in the *Journal* after the annual meeting.

Section 4—The Executive Committee may Act for the General Council

In order that the business of The Association may be facilitated during the interval between annual meetings, the Executive Committee shall meet from time to time at the call of its Chairman and shall have all the rights and powers of the General Council. It shall conduct all necessary business. In case of a vacancy in any office on account of death or otherwise it shall have power to appoint successors.

The President, the President-Elect, the Chairman of the General Council, the Honorary-Treasurer, the General Secretary, the Editor, and the Managing Editor shall be members *ex-officio* of the Executive Committee.

CHAPTER VIII.—COMMITTEES

Section 1—Duties and Powers of the Executive Committee

The Executive Committee shall hold one or more sessions before the close of the annual meeting at which it is elected. At this meeting it shall appoint chairmen of the standing committees for the ensuing year. Between the meetings of the General Council, the Executive Committee shall represent the General Council in all its business affairs and shall exercise all the rights and powers of the General Council. The Executive Committee shall report to the General Council at the annual meeting and at such other times as the Chairman of the General Council may request.

The Executive Committee may meet when and where it may determine. On the request in writing of any three members of the Executive Committee the Chairman shall call a special meeting. Five members, exclusive of the Chairman, shall constitute a quorum for the transaction of business.

The Executive Committee shall be responsible for the appointment of the General Secretary, the Editor, the Managing Editor, the Associate Secretaries, and any other appointive officers, and shall fix their salaries.

The Executive Committee shall have charge of the publication of the official *Journal* of The Association and of all published proceedings, transactions, memoirs, essays, papers and programs of The Association.

The Editor and Managing Editor shall present annual reports to the General Council and interim reports at each meeting of the Executive Committee. The Editor shall be reimbursed for his legitimate travelling expenses incurred on Association business.

The Executive Committee may appoint Editorial Boards to assist the Editors.

The Executive Committee shall appoint the auditor and shall have the accounts of the Honorary-Treasurer audited annually, or more often if desirable, and shall make an annual report on the same to the General Council.

Each member of the Executive Committee shall be reimbursed for his legitimate travelling expenses incurred in attending meetings of the Executive Committee other than the first meeting or meetings of the new Executive Committee, which may be held before the close of the annual meeting.

Section 2—Committee on Legislation

All matters relating to medical legislation, Federal or Provincial, and all matters requiring legislative action (made or contemplated) arising within The Association, or any of its branches, or any of its committees, shall be

referred to the Committee on Legislation for information and for any necessary action.

Section 3—Committee on Medical Education

To the Committee on Medical Education shall be referred all matters pertaining to medical colleges and medical education. It shall report upon the condition of medical education throughout Canada and upon any proposed change and may suggest methods for the improvement of medical education.

Section 4—Post-Graduate Committee

To the Post-Graduate Committee shall be delegated by the Executive Committee, the responsibility of carrying out the post-graduate plans of The Association.

Section 5—Committee on Program

This Committee, with the assistance of the Chairman and Secretary of each scientific section, shall have complete charge of the preparation of the program for the annual meeting.

Section 6—Committee on Constitution and By-Laws

To the Committee on Constitution and By-Laws shall be referred all matters relating to the subject before action thereon is taken by the General Council.

Section 7—Committee on Archives

The Committee on Archives shall be responsible for collecting as far as possible, (a) the obituaries of members dying since the last annual meeting; (b) all documents and information relating to the various members and activities of The Canadian Medical Association which are deemed worthy of preservation. The Editor of the *Journal* shall be a member *ex-officio* of this Committee.

Section 8—Committee on Public Health

(a) It shall be the duty of this Committee to place itself in communication with the official and voluntary health organizations of the Dominion.

(b) It shall be the duty of this Committee to keep the public informed through the various means available, on matters pertaining to health.

Section 9—Committee on Ethics and Credentials

To this Committee all matters of ethics and special questions of credentials shall be referred for consideration and report to the General Council or the Executive Committee.

Section 10—Committee on Economics

It shall be the duty of the Committee on Economics (excepting where otherwise provided) to deal with (a) social legislation which includes medical services or benefits presumably for medical services; (b) remuneration and employment of physicians by lay bodies, hospital or official bodies, including Federal, Provincial and Municipal Governments.

Section 11—Committee on Pharmacy

It shall be the duty of the Committee on Pharmacy to deal with (a) all matters arising out of the British Pharmacopœia or any Canadian Formulary or Pharmacopœia; (b) all matters arising out of the drug section of the Food and Drugs Act, the Narcotic Act, or the Patent and Proprietary Medicine Act, and (c) any inquiries from members of The Association relating to the use or standards of drugs.

Section 12—Hospital Service Committee

This Committee shall act in an advisory capacity to the Hospital Service Department of The Association.

Section 13—Committee on Cancer

To this Committee shall be referred all matters relating to the study and control of cancer.

Section 14—Special Committees

Each Special Committee shall assume, by direction, such duties as are allotted to it, and shall make progress reports to the Executive Committee at each of the meetings of that body or at any other time that such reports may be required by the President, the Chairman of the General Council, or the Executive Committee.

Section 15—Reports of Committees

Reports of all Committees shall be printed and mailed to all members of the General Council at least one week before the annual meeting.

Section 16—Limitations of Committees re Finances

No Committee shall expend any moneys or incur any indebtedness or obligation on behalf of The Association without the sanction of the Executive Committee.

CHAPTER IX.—ADDRESSES AND PAPERS

Section 1—Addresses at Annual Meeting

All addresses delivered at an annual meeting shall immediately become the property of The Association, to be published or not, in whole or in part, as deemed advisable, in the *Journal* of The Association. Any other arrangements for their publication must have the consent of the author or of the reader of the same and of the Editor of the *Journal*.

Section 2—Publication of Papers Presented at Annual Meeting

All papers, essays, photographs, diagrams, etc., presented in any section, shall become the property of The Association, to be published in the *Journal* of The Association or not, as determined by the Editor, and they shall not be otherwise published except with the consent of the author and of the Editor of the *Journal*.

Section 3—Disposition of Papers Presented at Annual Meeting

Each author of a paper read before any section shall, as soon as it has been read, hand it with any accompanying diagrams, photographs, etc., to the Secretary of the Section before which it has been presented. The Secretary shall endorse thereon the fact that it has been read in that Section, and shall then transmit it to the Editor of the *Journal*.

CHAPTER X.—PROVISIONS FOR DISCIPLINE

Section 1—If any member of The Association, after due enquiry by the General Council or one of its Standing or Special Committees shall be judged by the General Council to have been guilty of disgraceful conduct in any professional respect, he (she) shall be liable to censure, or suspension, or expulsion from membership in The Association by resolution of the Executive Committee, confirmed by a three-fourths vote at the next ensuing annual meeting of General Council.

Section 2—Should any member of The Association be convicted of any criminal offence, or have his (her) name removed from the register of the Medical Council of Canada, or of the licensing body of any Province of Canada, because of felonious or criminal act or disgraceful conduct in any professional respect, the Executive Committee may, by resolution, confirmed at the next ensuing annual meeting of the General Council, by a three-fourths vote of those present, censure, or suspend, or expel such member from Membership in The Association.

Section 3—Any member suspended or expelled by resolution, as aforesaid, shall thereby forfeit all his (her) rights and privileges as a member of this Association.

Section 4—Any member suspended or expelled by resolution as aforesaid, shall, subject to conditions imposed by the Executive Committee, be restored to membership upon resolution of the Executive Committee, confirmed at the next ensuing annual meeting of General Council.

Section 5—By subscribing to the application for membership under the terms of the By-Laws and Code of Ethics and becoming a member of The Association, every member attorns to these By-Laws and agrees to such right of discipline as aforesaid and thereby specifically waives any right or claim to damages in the event of his (her) being so disciplined.

CHAPTER XI.—AMENDMENTS

1. Notice of Motion, by individual members or others, to amend the By-Laws, must be placed in the hands of the General Secretary three months before the date of the annual meeting.

2. Amendments may be proposed by the General Council, the Executive Committee or the Committee on Constitution and By-Laws without notice of motion, but the proposed amendments shall be published in the *Journal* in two issues preceding the annual meeting.

3. The By-Laws shall be amended by a two-thirds vote of the members of the General Council in session present and voting.

NOTE.—Throughout these By-Laws masculine and feminine designations are interchangeable.

The Sub-Executive Committee was authorized to take up with the Provinces all negotiations in connection with Federation, and any matters which the Sub-Executive Committee thinks require attention of the whole Executive Committee are to be referred to the Executive Committee for mail ballot.

Hospital Service Department Notes

Surgery in the Small Hospital

The recent convention of the Alberta Hospital Association in Calgary considered many items of interest to the medical profession. These included a demonstration of Cesarean section by Dr. D. S. Macnab, a public broadcast address on cancer by Dr. M. T. MacEachern, of the American College of Surgeons, an address on legal liability by the President, Mr. S. H. Adams, K.C., of Calgary, and a discussion on the control of surgery, by Dr. A. E. Archer, of Lamont, and Dr. J. K. Mulloy, of Cardston. This subject, which appears with surprising frequency on hospital convention programs, considering how rarely it appears on the program at medical conventions, evoked considerable interest and discussion.

Pointing out that 51 per cent of hospitalized patients in Alberta are treated in hospitals of less than 50 beds, Dr. Archer emphasized the difficulties of the task of controlling elective surgery in smaller hospitals. Tribute was paid to the excellent work done in so many of these small institutions, but some of the handicaps, particularly with respect to diagnostic aids, were considered. Where the results of surgical work attempted did not justify its undertaking, the public must share in the responsibility, for all too often the doctor's decision was influenced by the patient's expectation that the doctor, working under great handicaps, could accomplish almost any surgical procedure and by the patient's desire to consider convenience and lessened expense. Essential pre-requisites for good surgery are (a) an accurate pre-operative diagnosis; (b) proper pre-operative care, in-

cluding adequate hospitalization before operation to permit rest and adaptation; (c) a properly equipped operating room; (d) a capable surgical team following correct routine; and (e) the utilization of the modern advances in post-operative care. It was suggested that there should be a minimum standard of operating-room equipment and routine for hospitals accepting elective major surgery. Staff conferences to analyze the results obtained were endorsed.

The appointment of a travelling consultant team, a surgeon, and an internist, was advocated by Dr. Mulloy. If such a team could be provided and could visit the rural hospitals every four to six weeks to advise and assist in the care of patients one of the most serious problems facing the small hospital would be minimized. It was suggested that such a visiting team could be supported by the Government, the Workmen's Compensation Board, and the College of Physicians and Surgeons. This proposal was endorsed by other speakers, although some felt that this development would be easier to achieve under some form of health insurance.

Are Blood Transfusions Worth While?

In many hospitals blood transfusions are of practically a daily occurrence and have become almost a routine practice in the treatment of certain conditions. The trouble and expense to the hospital of such procedure is much greater than would at first appear. Prospective donors must be found, and the task usually falls to a hospital intern or other employee; the routine work of the laboratory is interrupted to permit grouping to be done; the transfusion itself requires several assistants, by most methods; and breakage, particularly of syringes, is frequent; the mental hazard of anaphylactic reaction or of embolism adds a nerve strain to all sharing in the responsibility; and frequently the hospital itself must pay for a professional donor. Certainly, transfusions are ordered much less frequently in small hospitals than in large ones with organized departments and resident staffs. In view of the fact that the patient is often *in extremis* and the transfusion may be "tried" as a forlorn hope, the thought frequently arises in the mind of the administrator: "Are blood transfusions worth while?"

Recently an analysis of transfusion results in a charitable hospital near New York was presented by Dr. W. B. Talbot, of Valhalla, N.Y., in *Modern Hospital*. In this series, the improvement or cure of 73.5 per cent of the patients transfused was definitely ascribed *in part* to the transfusions received. The hospital itself paid the donors in 21.7 per cent of the transfusions, and it is interesting to note that the number of patients in this group who died was 49 per

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, 184 College Street, Toronto.

cent, whereas for the whole series transfused the death rate was but 26 per cent. Because of divers factors no particular significance can be attributed to this observation. No deaths were due to the transfusions. The writer believes that the blood transfusions were an important adjunct in the treatment of these cases and that the series reported relieved the hospital administration of any doubts as to the value of its transfusion program. He emphasized that anticipation of the need of blood, so that relatives and friends can be found and used as donors, helps in reducing hospital expenses for transfusion.

Medical Societies.

The Canadian Public Health Association

LABORATORY SECTION

The fourth annual Christmas meeting of the Laboratory Section was held in the Royal York Hotel, Toronto, on December 30 and 31, 1935, under the chairmanship of Dr. W. J. Deadman, Hamilton. The attendance of more than ninety members indicates that such a meeting is offering a definite opportunity to those who are interested in bacteriology, pathology, and chemistry to present new work in these fields. The meeting gives the opportunity also for a discussion of the findings of various committees of the Section whose studies have a practical bearing on the everyday work of the members. Among the important committees of the Section are the committee on standard methods, with appropriate sub-committees; the committee on the publication of recommended laboratory procedures for which no standard methods have been established; the committee on diagnostic outfits; and the committee on the directory of laboratory personnel in Canada.

In all, sixteen papers and five demonstrations were presented. At the evening session Dr. Robert S. Breed, of the New York State Agricultural Experiment Station, Geneva, discussed recent improvements in the methods for the examination of milk. At the luncheon session the Hon. J. A. Faulkner, M.D., Minister of Health of Ontario, stressed the increasing importance to physicians of laboratory services, indicating the phenomenal increase in the number of specimens examined in the Provincial Laboratories in Ontario. Prof. G. B. Reed, of Queen's University, recently returned from a visit to Russia, gave a survey of the socialization of medicine and public health in the Soviet Union. Dr. G. W. Rake, of the Rockefeller Institute for Medical Research, New York, discussed the epidemiology of meningococcus meningitis, presenting the results of his investigations which elucidate

the rôle of carriers in the transmission of this disease. Dr. J. G. FitzGerald presented the subject of diphtheria prevention, indicating the place of the Schick test, the necessity of a proper toxin and control, the extent of the use of diphtheria toxoid in the various provinces, and the established value of the present method of immunizing, namely, the administration of three doses of toxoid. Emphasis was laid on the fact that physicians should not overlook the possibility of clinical diphtheria in an immunized child. Active steps were taken by the Section to make possible through the cooperation of the directors of various laboratories throughout Canada an intensive study of the Kauffmann-White classification of *Salmonella*. Important findings were presented concerning the incidence of *Salmonella paratyphi* A and B. Arrangements were made for the trial of the complement fixation test in smallpox in the various provincial diagnostic laboratories. The first bulletin presenting new laboratory procedures which have been recommended for trial by the Section was distributed to the members. These procedures included cultural method for the primary isolation of *M. tuberculosis*, the virulence test for *Corynebact. diphtheriae*, method of drying complement for use in serology, typing of the pneumococcus, using the Neufeld reaction, and dark field examination of chancre fluid and the use of the combined outfit. It is purposed to publish further outlines as new methods are recommended.

The importance of the meeting is indicated by the attendance of members from Vancouver, Winnipeg, Halifax, Saint John, Quebec, Hull, Montreal, Ottawa, Sault Ste. Marie, North Bay, London, Kingston, Hamilton, St. Catharines, Guelph, Peterborough, and other centres.

The following officers were elected for 1936: *Chairman*, Dr. J. H. Orr, Kingston; *Vice-chairman*, Dr. A. J. Slack, London; *Secretary*, Dr. G. D. W. Cameron, Toronto; *Section Council*, Drs. D. T. Fraser, Toronto, M. H. Brown, Toronto, and W. J. Deadman, Hamilton.

The Fredericton Medical Society

The Fredericton Medical Society at their January meeting received a visit from a team of speakers from Saint John. Dr. R. A. H. Mackeen spoke on "Liver function tests", and Dr. Joseph Tanzman read a paper on "Anesthesia and analgesia in maternity practice", based on a series of cases treated in his own service.

The Montreal Physiological Society

At the December meeting of this Society the following papers were read (given here in abstract).

JOHN C. ARMOUR AND M. H. F. FRIEDMAN,
Department of Physiology, McGill University.—

Gastric Secretion in the Hibernating Groundhog.

The gastric secretory mechanism of groundhogs during hibernation was studied. In spite of the fact that the body temperature (rectal) of the hibernating animal was as low as 4°C ., there was a continuous secretion of gastric juice. This secretion was moderately high in concentration of free and total acid, but almost void of peptic power (Mett's method). Histamine stimulated an increased secretion and an increase in the free and total acid, but did not affect the peptic power of the juice. On the other hand, stimulation of the vagi produced an increase in the concentration of the free and total acid as well as the pepsin. The continuous gastric secretion in the hibernating groundhog is in marked contrast with the intermittent gastric secretion which occurs in dog, cat and man. In the latter-named animals secretion is dependent on some stimulus (nervous or chemical) whilst in the hibernating groundhog the continuous secretion is independent of any continuous stimuli, but is due to the special properties of the gastric glands.

SIMON DWORKIN, Department of Physiology, McGill University.—Hearing Acuity in the Cat.

The hearing acuity of the cat was measured by the conditioned reflex method in a sound-proof room. As compared with that of man the hearing threshold of the cat is virtually the same for all frequencies from 100 cycles per second to 3,000 c.p.s. Then the cat audiogram differs, for it remains flat to 10,000 c.p.s.; in fact the most sensitive point in this animal lies between 5,000 and 10,000 c.p.s. Between 14,000 and 16,000 c.p.s. the threshold for the cat is about 20 decibels lower than that for man. This difference between feline and human hearing is due to the greater frequency range of the former.

H. SELYE, R. L. STEHLE AND J. B. COLLIP, Department of Biochemistry, McGill University.—Recent Advances in the Experimental Production of Gastric Ulcers.

Dodds and Noble have been able to show that extracts prepared from the posterior lobe of the pituitary produce gastric ulcers in various experimental animals such as the rabbit, rat and guinea pig. The question arose whether this effect is due to a known pituitary principle or to a special gastro-toxic substance. The above-mentioned authors have already established that the gastro-toxic activity is particularly high in the vasopressor fraction. Repeating these experiments with highly purified preparations of the melanophore, oxytocic and pressor hormones of the pituitary, we were able to show that only the pressor principle exerts any effect on the stomach mucosa.* This effect is well marked in

preparations containing 200 pressor units in 1 mg., if 1 mg. is given to a rabbit in two doses within 24 hours. From this we conclude that the effect on the stomach is most probably due to the pressor hormone itself. Two hundred units of an oxytocic preparation containing 250 units per milligram administered similarly produced no effect. This was true in the case of a melanophore preparation containing 50 melanophore units per milligram; 200 units of this substance administered in two doses with 24 hours was also without effect.

Hanke found that adrenalin, atropin and insulin produce marked stomach ulcers in the cat. We extended these experiments to the rat, and found that insulin produces changes in the stomach which are similar to those produced by Dodds and his co-workers with posterior pituitary extracts. We found, further, that removal of 75 per cent of the liver will occasionally produce similar gastric lesions. If relatively small doses of insulin are given to such partially hepatectomized animals the lesions become unusually severe. A similar increase of the gastro-toxic effect of partial hepatectomy may be obtained by the simultaneous removal of both adrenals or of the pituitary. Adrenalectomy rarely, if ever, has any effect on the gastric mucosa in non-hepatectomized animals. Removal of 85 per cent of the liver invariably produces marked gastric changes in otherwise normal rats. Since hepatectomy, hypophysectomy and insulin tend to lower the blood sugar, and since the blood sugar was particularly low in those experimental animals in which the gastric changes were most marked, it is possible that a low blood sugar enhances the production of gastric ulcers. Fasting for a period of 5 days or more invariably produces ulcers and a marked oedema of the stomach in that region which is covered with squamous epithelium in the rat. These lesions differ from those produced with vasopressin, hepatectomy, or insulin, since the latter are invariably localized in that part of the stomach which is covered with a typical gastric mucosa. (In abstract).

The Saint John Medical Society

The Saint John Medical Society was addressed by Dr. R. A. H. Mackeen at their December meeting on the subject of "Liver function tests". Dr. Mackeen's talk was of exceptional usefulness, for as Director of the Provincial Laboratory, this type of examination comes directly under his care.

The January meeting of the same Society was addressed by Dr. D. C. Malcolm, who spoke on "The treatment of carcinoma of the breast". Dr. Malcolm's paper dealt with the anatomy, physiology and pathology of the breast, and from this foundation of fact he pro-

* These substances were prepared by Prof. R. L. Stehle, Department of Pharmacology, McGill University.

ceeded to review the surgical and radiation treatment of malignancy of the breast.

The attendance at the Saint John Medical Society has been most gratifying this winter. Many physicians from out of town appear quite frequently at these monthly meetings.

University Notes

Dalhousie University

Dr. C. B. Weld, of the Department of Physiology in the University of Toronto, has been appointed to the Professorship of Physiology at Dalhousie University in succession to Dr. E. W. H. Cruickshank, who resigned in December, 1935. Dr. Weld is at present in London where he is pursuing further studies. He is a graduate from the University of British Columbia and received his medical education at the University of Toronto.

McGill University

REORGANIZATION OF THE MEDICAL COURSE

For some years the Medical Faculty of McGill University, in common with similar bodies all over the world, has been giving careful consideration to the curriculum of medical studies, in an effort to determine how it may be readjusted to the professional, social and economic changes that are everywhere in progress. As a result of these deliberation it developed a plan for the reorganization of its medical course along lines which, while retaining all of the sound educational features of the present one, gives the added advantages of greater adaptability and a more economical use of the time devoted to training. This plan, after prolonged study, has been approved by the University authorities and will be put into effect with the opening of the new session next September.

The new plan provides that:

1. The minimum period of professional training required by the University as a qualification for the independent practice of medicine shall be five years, including
 - (a) four years of medical study in the University leading to the degree of M.D., C.M.; and
 - (b) one year of internship in an approved hospital, OR one year of further medical study in the Faculty of Medicine of McGill University or of another medical school approved by it.
2. A certificate that his medical education is completed and that he is eligible to sit for the examination of a licensing board shall

not be issued to any graduate until the University is in possession of satisfactory evidence that he has completed the full requirements.

The effect of this action will be to replace the present undergraduate course, which spreads over five academic years of seven and a half months each, by a course covering four years, each with a nine-months' session, and to bring the year of hospital internship within the five-year period of training which is now required before licence in 28 Provinces and States, and which the Faculty believes to be a necessary part of every doctor's education. The new regulation provides that this year shall be spent as an intern in an approved hospital, or "in further study in the Faculty of Medicine of McGill University or of another medical school approved by it". It is to be expected that in the majority of cases the post-graduate intern year will be chosen, since it is the most direct and most economical pathway to practice. Those who travel this route will be able to accomplish in five years what it now takes six to do and will save the cost of tuition, board and lodging for one year.

To those who prefer to devote the fifth year to further study in fields in which they are especially interested, several alternatives are open, since the time may be spent in advanced work along scientific or clinical lines, either at McGill or abroad. An opportunity is thus offered to those, for example, who wish to obtain a British qualification and who may spend the graduate year in an English hospital school preparing for the examination of one of the British Licensing Bodies.

The minimum requirement for entrance to the four-year course will remain as it is at present, namely, the satisfactory completion of three years of study in a College or Faculty of Arts and Science, including both lectures and laboratory courses in Physics, Biology and Chemistry, both general and organic. A sound, general education is an essential foundation for professional training, however, and a four-year course leading to the B.A. or B.Sc. degree is considered the most desirable preparation for the study of medicine. Preference will be given, therefore, to applicants who have had a full academic course in which the humanistic studies have not been sacrificed to a narrow scientific specialization.

With the progress of medical science and an increasing social consciousness of the need for the preservation of health there is an insistent demand for an even more thorough training than has been required in the past. In its reorganized course McGill University has aimed at meeting this demand without increasing the long and arduous period of preparation, while actually decreasing the cost to the student.

Cecil Percy Martin, M.A., M.B., D.Sc. (Dublin), has accepted the appointment of Robert Reford Professor of Anatomy at McGill University. Dr. Martin will take up his duties on September 1, 1936, filling the vacancy created by the resignation of S. E. Whitnall, M.A., M.D., in December, 1934, who accepted the Chair of Anatomy in Bristol University.

Dr. Martin at present holds the appointment of University Anatomist and Chief Demonstrator in Anatomy in Trinity College, Dublin University. He was born in Dublin, in 1892. In 1914 he entered the Royal Irish Constabulary and the following year served with the army, being wounded in 1918.

He later returned to the Royal Irish Constabulary, with which organization he was associated until July, 1922, when it disbanded. After a year spent in the Dominions Office in London, he entered Trinity College, Dublin, in 1923 and graduated with a B.A. degree with First Class Honours, the Large Gold Medal in Natural Science and the Hackett Prize and Exhibition.

In 1928 he took his M.B., B.Ch., B.A.O. Degrees in Medicine, taking first place in all three degrees, and winning the Haughton Medal and Prize in Clinical Medicine at Sir Patrick Dun's Hospital. In September, 1928, he was appointed Chief Demonstrator in Anatomy at Trinity College and in 1930 University Anatomist and member of the Senate of Dublin University. He won his M.Sc. Degree in the same year. In 1930 he was elected President of the Section of Anatomy and Physiology of the Royal Academy of Medicine in Ireland, and in July, 1934, was elected President of the Dublin University Biological Society and appointed Permanent Secretary for Ireland of the International Congress of Anthropological and Ethnological Sciences. Since then he has received the degrees of M.A. and Sc.D., from Dublin University. Dr. Martin has also published a number of scientific articles and a work on "Prehistoric Man in Ireland".

It is a most just punishment that man should lose that freedom which he could not use, yet had power to keep if he would; and that he who had knowledge to do what was right, and did not, should be deprived of the knowledge of what was right; and that he who would not do righteously when he had the power should lose the power to do it when he had the will.—St. Augustine.

Sweetness in temporal matters is deceitful; it is a labour and a perpetual fear; it is a dangerous pleasure, whose beginning is without providence, and whose end is not without repentance.—St. Augustine.

Special Correspondence

The Edinburgh Letter

(From our own correspondent)

As I write all other matters are overshadowed by the death of the King. Nowhere in the Empire had His Majesty more loyal subjects than in Scotland. His visits to the ancient Palace of Holyrood House and his annual residence at Balmoral afforded frequent opportunities for his Scottish subjects to know their Sovereign. They gave their loyal respect to him as their King; they gave him their affection as a man. Consequently, it was with a real sense of personal loss that the Scottish people heard of his death. On the day of the funeral a memorial service was held in St. Giles' Cathedral, the service synchronizing with that held in St. Paul's Cathedral, London. A salute of 70 guns was fired from Edinburgh Castle—one for each year of the King's life. The first gun was fired as the funeral procession left Westminster. His late Majesty took a great interest in the medical services of the country. He was intimately associated with the work of the hospitals and took a special interest in cancer research. Following his accession to the throne the King consented to become Patron of the British Medical Association and remained Patron throughout his reign. The Association sent to His Majesty King Edward an address begging leave to express the respectful and heartfelt sorrow of the President and members "at the heavy affliction that has fallen upon Your Majesty, the Queen Mother, and the other Members of the Royal Family by the death of our beloved Sovereign King George. We humbly tender to Your Majesty congratulations upon Your Accession to the Throne, and earnestly pray that Your Majesty's Reign may be long and illustrious and blest with peace." The address was signed by Sir Humphry Rolleston, President (Acting); Dr. E. Kaye Le Fleming, Chairman of Council; Mr. H. S. Souttar, Chairman of Representative Body; Mr. N. Bishop Harman, Treasurer, and Dr. G. C. Anderson, Medical Secretary.

The general interests of the members of the British Medical Association in Scotland are watched over by the "Scottish Committee". This Committee consists of representatives from all the Divisions of the Association in Scotland. Another Committee, the "Insurance Acts Subcommittee (Scotland)" is charged with the specific duty of looking after the interests of practitioners who have entered into a contract to give medical attendance under the National Health Insurance Acts. This Committee is regularly consulted by the Department of Health for Scotland on matters affecting the service. Likewise, the conditions of service of doctors who take part in the Highlands and Islands Medical Service are supervised by the

"Highlands and Islands Sub-Committee". A "Hospitals Sub-Committee" has the duty of dealing with matters affecting the members of the medical staffs of the hospitals, while in view of the coming developments in Consultant and Specialist Services a new Committee composed entirely of consultants and specialists has recently been set up. There is a body of opinion, however, in the Scottish Committee—which is composed of men who are in various branches of practice—that a special sub-committee composed entirely of general practitioners should be formed to deal with all matters affecting their particular interests. At a recent meeting of the present Committee it was decided that such a sub-committee should be set up. This course has been taken partly as a result of the recent report issued by the Department of Health for Scotland on Maternal Morbidity and Mortality. In view of the terms of that report, however, a special sub-committee has also been appointed with a view to drawing up a memorandum on maternity problems for presentation to Scottish Local Authorities, members of parliament, and the press. A questionnaire is to be issued to the various Scottish Divisions of the British Medical Association on the subject.

As a result of the death of Mr. A. Noel Skelton, who was returned as a member of parliament for the Scottish universities at the recent general election, but who died before the election was completed, a by-election has been necessary. There are three candidates for the vacant seat—Mr. Andrew Dewar Gibb (Scottish National), who was a candidate at the recent election, The Right Hon. James Ramsay MacDonald, Lord President of the Council and formerly Prime Minister (National Government), and Mr. David Cleghorn Thomson (Labour). A great deal of controversy has taken place regarding the candidature of Mr. Ramsay MacDonald, and numerous letters expressing very different points of view have appeared in the press. Mr. MacDonald is standing as a supporter of the National Government. He is, however, not a graduate of a Scottish university, though he holds the honorary degree of Doctor of Laws of several universities, including Scottish universities. Attention has also been drawn to the fact that prior to the formation of the National Government he had been opposed to the university franchise. Mr. Gibb is the Professor of Law in the University of Glasgow. Mr. Cleghorn Thomson, who is a son of the late Dr. John Thomson, of Edinburgh, the well-known authority on the diseases of children, is a graduate in Arts of both Edinburgh and Oxford Universities.

R. W. CRAIG.

7 Drumsheugh Gardens
Edinburgh.

The London Letter

(From our own correspondent)

All other events of the past few weeks have been overshadowed by the death of King George. He was "our most illustrious Doctor", the form in which the toast of "His Majesty" is given at the dinners of London University schools. His interest in the medical profession has always been a close one, for he was an honorary member of the British Medical Association as far back as 1903, and he became Patron when he succeeded to the throne in 1910. One of his last public appearances in connection with the hospitals was in 1935, when, immediately after the Silver Jubilee celebrations, he opened the British Post-Graduate Medical School at Hammersmith. On that occasion he expressed once more his gratitude for the skill and care which he and his family had received from members of the medical profession. The authoritative statement indicates that the illness of eight years ago had placed heavy burdens on the heart and the margin of cardiac reserve narrowed rapidly in the last days of his last illness. His late Majesty's remark at Hammersmith was a public acknowledgment of what he must owe to Lord Dawson of Penn and other members of the profession who have played their part. The keen anxiety which must have been attached to the care of such a patient during the last eight years, and the constant unobtrusive watchfulness necessary throughout the joyous happenings of 1935, must have placed a great burden upon the King's physician and *The Lancet* rightly voices the gratitude of the Empire to Lord Dawson in this respect.

In the last three years an important committee has been attempting to reduce to order a very complicated branch of statute law, and it has now issued its comments as well as a draft bill which seeks to consolidate all the existing measures relating to public health. The first great public health charter appeared sixty years ago, and was, itself, largely a consolidating measure. Since that time there have been at least sixteen Acts and a very large number of other measures, such as those concerned with the notification and prevention of infectious diseases, and with maternity and child welfare. The draft bill is a gigantic measure of 334 clauses and two schedules, but even this is only about half the size of the total number of measures it seeks to replace. As a matter of fact, what is now included under the activities of the Minister of Health spreads a long way outside the narrower aspects which concern the medical profession. Provisions concerning the connection of drainage and rain-water pipes and many other of the housing measures have only a remote connection with preventive medicine. One of the most important changes in the new bill is that many of the proposals of the old Acts which operated only after they had been adopted by the local authorities or put into force by a special

order of the Minister of Health, will now become of general application, so that local authorities throughout the country will carry out public health procedures with much greater uniformity than hitherto. Another important clause gives the Minister wide powers to make regulations dealing with infectious diseases, and, as a novel feature, special mention is now made of the dangers to public health brought about by aircraft. On the whole, the committee responsible for the new Act has dealt with the legal and administrative sides rather than with the more medical aspects of public health and it has been suggested that medical opinion would go considerably further as regards stiffening the law. Two other advances may be mentioned; local authorities are to be permitted to provide laboratories and they may now provide for Out-patient Departments without any difficulty. It is to be hoped that this measure will go easily through Parliament, and the air will then be cleared for further advances in the future.

An important advance with regard to the very complicated milk problem has been made by the publication of a special report dealing with the bacteriological grading of milk. Prof. G. S. Wilson and his assistants at the London School of Hygiene and Tropical Medicine, have been working for three years mainly to devise a simple test for grading milk. They were not concerned with the question of disease-causing organisms, but rather with the question of cleanliness and keeping quality. Thus their findings have no direct bearing upon the question of safe milk. They have modified the methylene-blue test in such a way that it can now be performed simply, inexpensively, and accompanied by only a very small experimental error. This test, they recommend, should be adopted for the routine grading of milk, but, outside their rather narrow terms of reference, these authorities have wisely strayed in order to recommend that the present complicated grading of milk should be modified. From the public health point of view, probably only two divisions need be made on the basis of cleanliness, namely, into (a) milk that is suitable, and (b) milk that is unsuitable for human consumption in the liquid state. From the point of view of safety, this might be carried a little further, in that the public is learning to ask for tuberculin-tested milk. Following hard upon the publication of this report it is announced that a completely new system of grading milk will be in force after April 1st, and thus we are yet another stage further towards that really safe milk which intelligent members of the medical profession so earnestly want.

Lord Horder has now retired from the active staff of St. Bartholomew's Hospital, and a farewell lecture on "Clinical Medicine", recently published, is an interesting survey of the progress he has witnessed during his active association with that institution. He speaks of three great advances during this period. The

great advance in post-mortem technique he places first, wisely adding a reservation that too much of the post-mortem material should not be deferred for later examination. Second, he places the development of laboratory methods, again issuing a warning against the too ready incursion of the pathological worker into the sick room. Third, Lord Horder places the great developments of radiology. All these three advances present the practical physician with a large amount of data from which he has to select the good from the bad. What Lord Horder defines as "the ability safely to omit" is probably the most important attribute of the experienced physician. It is good to know that the experience of this popular physician will still be harnessed to the teaching side through the medium of the Post-Graduate Medical School at Hammersmith, and he is to take charge of a ward there shortly for a period of ten weeks.

ALAN MONCRIEFF.

121 Harley St.,
London, W.1.

Letters, Notes and Queries

The Administration of Iron

To the Editor:

The letter of E. Lozinski (*Canad. M. Ass. J.*, 1936, 34: 216) serves to show that the writer has not followed the reasoning set forth in the paper he criticizes nor been aware of the gastric physiology of the patients we were considering. In our paper we were not advocating massive doses of iron but only pointing out why clinicians have found it necessary to give large doses of certain preparations to produce results. Clinicians have found that some 60 to 90 grs. of Bland's pill are usually necessary to give a rapid rise in hæmoglobin and a reticulocyte reaction. We were quite aware that if all the ferrous carbonate in such doses were dissolved by the gastric hydrochloric acid, a great deal more ferrous chloride would be produced than the small amount of ferrous chloride given as such, which again clinical experience has shown to be necessary. If there are normal amounts of hydrochloric acid present in the patients' stomachs more or less of the ferrous carbonate probably escapes solution and is valueless. Many patients have no hydrochloric acid, and only a small fraction of the insoluble ferrous carbonate could be dissolved by carbonic or other acids that may occur in this condition, as Sullman has clearly pointed out.

Answers to questions appearing in this column should be sent to the Editor, 3640 University Street, Montreal.

Any other organic ferrous salt is far less useful than ferrous chloride. Five grs. of ferrous chloride is just as much a "massive" dose, judged by clinical efficiency, as 60 to 90 grs. of Bland's pill.

G. H. W. LUCAS
V. E. HENDERSON

Toronto, February 12, 1936.

Some Practical Uses of Phenol

To the Editor:

In view of the ravages caused by an epidemic of "grippe" and of the great economic loss, often with distressing deaths, which it involves, the report by Dr. Farrell in the last number of this *Journal*, on the use of phenol in this disease raises a question of great practical importance.

Attacks of grippe can be aborted by the local use of 0.5 solution of phenol as the writer has demonstrated in practice for some years. A 4 per cent solution of phenol containing the same quantity of salt is prescribed; and two drachms of this diluted to two ounces (1-8) with warm water are taken up in a bulb-syringe. With the head thrown well back, the nose is filled with the liquid, which is retained for 30 seconds or more. The fluid is then allowed to run out and the nose blown freely, without closing it, to remove accumulated matter, and the procedure repeated, so that the antiseptic may be kept in contact with the cleansed mucous membrane. It is but seldom necessary to repeat the treatment, but in chronic cases it can be used indefinitely.

This procedure is of great benefit also in that most neglected of all troubles, chronic sinusitis, which is very generally ignored by the practitioner, while even the specialist seems to think that if pus be not present that nothing need be done and conditions which produce deafness are allowed to persist for years unchecked. Chronic disease needs what may be described as chronic treatment, and a sufferer from old nasal trouble needs to wash the inside of his face with about the same regularity that he does the outside. Persistence in this simple treatment brings most gratifying results. Chronic rhinitis with ozæna can be cleared up, long-standing tinnitus made to disappear, and although the remedy cannot act on the sinuses directly it seems probable that its indirect effect can remove the disease when secondary changes have not advanced too far.

Steadily increasing deafness will become apparent in later life in sufferers from this disease who have not had adequate treatment, a point which cannot be too strongly impressed upon those who are responsible for the future of our youth. As deafness is so common, the effective treatment of chronic sinusitis is of even more importance to public welfare than the control

of grippe, and the conditions to be remedied should be forcibly brought before the profession and the public too should receive enlightened instruction.

The "Thus far and no farther shalt thou go" action of phenol in erysipelas is well known, but the fact that a spot of ring-worm or other mould infection if painted with phenol, which is washed off after six or seven seconds, will need no further attention is not so generally realized. This treatment should be of great value in lupus also, but the writer has not had occasion to use it. If phenol be left on the skin, paralysis of the capillaries lasting from 3 to 6 months will occur, but no permanent damage.

About forty years ago a tuberculosis cure was announced in New York and a good deal of mystery made as to its combination. The writer prepared a solution containing the designated doses of phenol and pilocarpine which was given hypodermically to a woman in hospital whose case was diagnosed as tuberculous peritonitis. Its use was followed by prompt recovery and a gain of about twelve pounds in weight in a little over a week. The Chief attributed this result to rest in bed, etc., but there was no reason to assume that the treatment was valueless. There is too great a tendency to ignore measures which may be of great value in incipient cases because they cannot save desperate ones.

Another very practical use for phenol is in removing corns or warts, which are of similar infective origin but subjected to different conditions. The indurated part is removed and the base painted with phenol, which is not washed off but left to penetrate, as the thickened skin is sufficient protection. Pain is abolished almost instantly, and two or three treatments at intervals of several days are usually enough to remove the pathological tissue.

These simple uses of phenol do cheaply and effectively work for which expensive and often unnecessarily complicated preparations are employed, and they can be confidently recommended to those who are not familiar with or who have forgotten this reliable, old-fashioned remedy.

R. A. KERRY.

Montreal,

January 17, 1936.

Extension of Travelling Privileges

To the Editor:

As you are aware the railways permit extension of the limit of tickets on account of illness, where passengers have been under professional care, and where it will be dangerous to their health to travel until some date beyond that of the expiration of their tickets. This, of course, does not cover those who make the journey to obtain medical advice, medical treatment, or to undergo an operation for illness existing prior

to the commencement of their trip. This extension is given on submission of a certificate executed by their physician in attendance.

We have found that there has been some abuse of this privilege, and, therefore, would it be too much to ask you to circularize your members or possibly include an article in your *Journal*, asking that every precaution be taken by members of your profession in the signing of such certificates, to see that cases are absolutely legitimate and in accordance with the regulation governing this concession?

JOS. B. PARKER,

*Secretary, Canadian Passenger
Association, Western Lines.*

Winnipeg, 320 Union Station,
January 8, 1936.

Topics of Current Interest

Legislation Pending in Congress Concerning Food, Drugs, Cosmetics and Therapeutic Devices

Since Senator Copeland first introduced the so-called Tugwell food, drug, therapeutic device and cosmetic bill¹ in the Senate, in the Seventy-Third Congress, numerous other bills of similar purpose have been offered in both the Senate and the House of Representatives. Those introduced in the Seventy-Third Congress died when that congress expired, January 3, 1935. Such bills² as have been introduced in the Seventy-Fourth Congress are still pending. Outstanding among these is S. 5, introduced by Senator Copeland and commonly called the Copeland bill. It is officially entitled "An Act To prevent the adulteration, misbranding, and false advertising of food, drugs, devices, and cosmetics in interstate, foreign, and other commerce subject to the jurisdiction of the United States, for the purposes of safeguarding the public health, preventing deceit upon the purchasing public, and for other purposes."

The Copeland bill, after many amendments and in a form much different from that in which it was introduced, was passed by the Senate, May 28, 1935. It then went to the House of Representatives, where it was referred to the Committee on Interstate and Foreign Commerce, which in turn referred it to a sub-

committee, along with other bills of similar purport. The subcommittee has given extensive hearings on these bills and now has them under consideration. It may be expected to report to the full committee shortly after Congress convenes next January. The committee, after considering the subcommittee's report, will then report a bill to the House of Representatives. This bill may be either the Copeland bill in the identical form in which it passed the Senate, or the Copeland bill with amendments, or an entirely new bill, possibly composed of the good features of all pending legislation. The bill reported by the committee will then take its place on the House calendar and, depending on parliamentary procedure, come before the House for debate and action. If it passes, it will in the ordinary course of events be returned to the Senate. The differences in the bill as passed by the two bodies will be adjusted through conference committees before the bill is eventually sent to the President for action.

The Copeland bill provides a waiting period of twelve months after its approval before its penal provisions become effective.

Every one interested in the enactment of federal food and drug legislation better than that which now prevails and in the extension of such legislation to protect the public against fraud and danger in cosmetics and prophylactic and therapeutic devices must recognize that the present Copeland bill is the result of many compromises. On its face, the bill may appear to be materially more rigid in its requirements than the Food and Drugs Act of 1906. It does cover cosmetics and therapeutic devices, which existing law does not cover at all. It is more rigorous in its requirements on the labeling of foods and drugs and in covering advertising as well as labeling. A careful study, however, discloses loopholes and evidences of weakness in its administrative provisions, particularly with reference to drugs, including "patent" and proprietary medicines, and prophylactic and therapeutic devices. These should be corrected before the bill is enacted.

A critical analysis of the Copeland bill now pending before the subcommittee of the Committee on Inter-state and Foreign Commerce of the House of Representatives, by the Bureau of Legal Medicine and Legislation of the American Medical Association, appears elsewhere in this issue.³ The subcommittee, it is hoped, will develop a bill free from such defects as are pointed out in this analysis. Legislation should be enacted in a form better designed for the protection of the consumer than is the present bill.—Abs. *J. Am. M. Ass.*, 1935, 105: 2075.

1. Seventy-Third Congress, S. 1944.

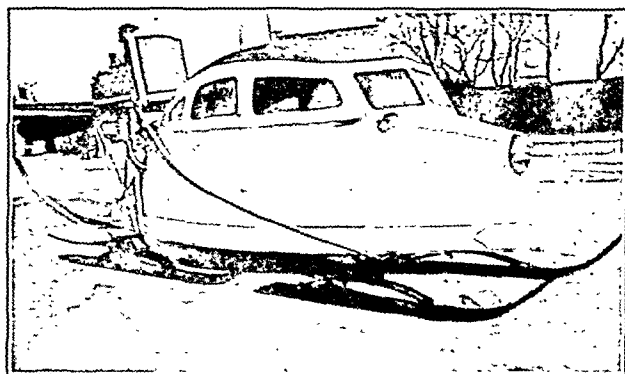
2. Seventy-Fourth Congress, S. 5, S. 580, H. R. 3972, H. R. 6145, H. R. 6688, H. R. 6906, H. R. 8744, H. R. 8805, H. R. 8941.

3. 1935, 105: 2055.

Snow-Sedans

The following note in regard to "snow-mobiles" or "snow-sedans" will prove of interest to our readers.

The manufacture of snowmobiles is proving one of Saskatchewan's expanding industries. A small snowmobile factory now operating at Moosomin, employs 20 men and is turning out snowmobiles for sale in both Saskatchewan and Manitoba. The factory is operated by R. J. Fudge, garageman, of Moosomin. The snowmobiles are said to average about 15 to 18 miles to the gallon on favourable snow conditions. Hon. T. C. Davis, K.C., attorney-general, recently used one of the machines to travel from Moosomin to Fairlight, a distance of some 25 miles. He made the trip in slightly more than half an hour. These machines, doubtless, are very valuable in the north country.



"Snow-Sedan"

The snow-sedans are completely streamlined, being built on four hard-wood runners with steel shoes, the runners being sleigh-track width in order to expedite travel where paths have been broken. They have ample accommodation for four persons and are engined by either four- or eight-cylinder motors according to requirements. The propellers are of special design and local manufacture, and the result of years of experimental work with a view to obtaining the correct pitch to meet all conditions. Machines have been shipped to doctors, liverymen, travellers and others throughout Saskatchewan and Manitoba and are giving entire satisfaction everywhere.

The world's a floor, whose swelling heaps retain
 The mingled wages of the ploughman's toil;
 The world's a heap, whose yet unwinnowed grain
 Is lodg'd with chaff, and bury'd in her soil:
 All things are mixt, the useful with the vain;
 The good with bad, the noble with the vile:
 The world's an ark, wherein things pure and gross
 Present their lossful gain, and gainful loss,
 Where ev'ry dram of gold contains a pound of dross.
 —Francis Quarles.

Medico=Legal

XX.

Davy v. Morrison*

Ontario—Husband's right of action for damages arising out of operation performed upon his wife—Operation performed by a surgeon other than the one designated by the patient—Established practice—Standard of care.

The plaintiff, a resident of Detroit, sued the defendant, a physician and surgeon practising in Kingston, Ontario, for damages suffered in consequence of an operation performed on the plaintiff's wife for a gall-bladder trouble. There was some complaint against the defendant with respect to a second operation performed by him for a retroverted uterus, but this was not pressed at the trial. It was alleged that as a result of the first operation, the wife developed marked jaundice, suffered extreme colicky pains, nausea and vomiting, and lost weight steadily. Upon the advice of surgeons in Detroit a cholecystectomy was performed, and in the course of this further operation the gall-bladder was found adherent to the abdominal wall, where it had been sewed by the defendant, and in addition there was a complete torsion of the gall-bladder which shut off the flow of bile.

As to the husband's right of action in such cases, it was held that it was a tort actionable by the husband to do physical harm to the wife, provided always that the act complained of was wrongful as against the wife and that the husband in consequence of it was deprived of her society or services. An action such as the present one, said Mr. Justice Riddell, is based upon a tort as well as upon a breach of contract.

In support of the plaintiff's action it was alleged that there had been an agreement between the defendant, who was the Davy's family physician, and Mrs. Davy that the operation would be performed by Dr. Austen, professor of surgery at Queen's University, but that actually it was performed by the defendant. The plaintiff's complaint was, first, that the defendant had operated at all, and, second, that he had operated negligently.

There was, said Mr. Justice Riddell in appeal, some misunderstanding as to who was to handle the knife, but the real arrangement in his opinion was that the operation was to be such as Dr. Austen thought proper and was to be performed as he thought proper. This had been done. Whether there would be a cause of action if a surgeon other than the one agreed upon had performed an operation, and the change were shown to have caused damage, the court did not decide formally.

On the question as to whether the defendant had performed the operation with due skill and

* (1931) 4 D.L.R. 619, Ontario Supreme Court, Appellate Division.

care, the medical evidence was that the procedure adopted by the defendant, while not one that was generally approved, was a recognized practice. It is not malpractice to follow established practice though some surgeons do not approve of it. The medical witnesses contented themselves with stating what *they* would do. None of them ventured to point to any default on the part of the defendant to which he was willing to attribute Mrs. Davy's condition. Nor did her condition speak for itself, *res ipsa dixit*, as it would, for instance, where a surgeon, employed to remove one eye, removes the other. The plaintiff therefore had failed to discharge the onus of proof. He had failed to establish that there was want of skill or care in the operation and that Mrs. Davy's condition was due to anything done by the defendant or which might not have occurred after the most skilful operation.

A surgeon of course does not guarantee success or perfect results. He guarantees only that he will exercise a reasonable degree of skill and learning and exert his best judgment to bring about a good result. The mere fact that there may have been an unfortunate result does not give rise to responsibility. It must be shown that the result was due to the surgeon's default. The appeal was therefore dismissed, Latchford, C. J., and Fisher, J. A., dissenting. (G.V.N.N.)

ing muscles innervated through the same nerve segments as supply the joint. A great part of the stiffness and limitation of movement is due, not to exostoses, but to fibrositis, muscle spasm, and fibrosis of the joint capsule. Deformity is due to changes in the bony architecture and to new muscle attachments pulling the bones out of position.

While the prognosis is eventually bad, much may be done to stop or delay progress, and certainly the concomitant fibrositis, productive of many of the symptoms, can be often successfully treated. This fibrositis is, in these cases, almost invariably of purely metabolic origin, being caused by defective venous return with accumulation of irritant waste material. The more the resulting fibrosis, the poorer the venous return, and a vicious circle is established. Much may be done by general measures designed to arrest cardiac, renal and vascular degeneration, and to promote elimination by skin, kidney and bowels. Locally, hot douches, baths, diathermy, etc., tend to increase the circulation to the joint, and relieve pain and muscular spasm. Rough manipulations are positively contraindicated. Expert massage of the fibrositic nodules is always indicated and is productive of much relief, though the process of treatment may itself be quite painful. Removal of septic foci plays only a very small part in the treatment of this disease. Diet is not specific, but is important, in that it may reduce obesity, prevent cardio-renal degeneration, or may preserve the patient from metabolic disturbances due to indigestion.

W. FORD CONNELL

Abstracts from Current Literature

Medicine

Osteo-arthritis and its Concomitants. Gordon, R. G., *Brit. M. J.*, 1935, 2: 1083.

It is to be emphasized that osteo-arthritis is essentially a degenerative disease, occurring as a rule in elderly persons with failing circulation and consequent faulty elimination of metabolites. The affected joints may usually be shown to have been previously damaged by strain, trauma or other disease.

The essential pathological change is a degeneration of the central cartilage, which becomes thin and ribbed and finally disappears with exposure of the underlying bone. The bony changes consist of the formation of exostoses and eburnation of the exposed bone. The capsule and ligaments first fibrose, but may finally disappear, leading to new muscle attachments.

The pain in the disease is due to two factors—pressure on the exposed bone and muscular spasm. The muscle spasm has been said to be a reflex protective mechanism to guard the joint, but the author believes that it is due to direct reflex irritation through the neuronie arc, affect-

Studies Relating Vitamin C Deficiency to Rheumatic Fever and Rheumatoid Arthritis: Experimental, Clinical, and General Considerations. 1. Rheumatic Fever. Rinehart, J. F., *Ann. Int. Med.*, 1935, 9: 586.

Guinea pigs were maintained on a basic diet adequate in all food factors except vitamin C. By regulating the intake of vitamin C the animals were kept for varying periods of time in acute and subacute or chronic states of scurvy. The pathological effects of scurvy alone and of similar degrees of scurvy combined with infection were studied, using as controls infected and non-infected animals on the same basic diet. adequately supplemented with orange juice. The infecting organisms used were various strains of a beta hæmolytic streptococcus, a gamma type streptococcus, and *B. bronchosepticus*. It was found that in the presence of adequate vitamin C. nutrition, rheumatic type lesions were not observed. When superimposed on vitamin C deficiency, no matter which of the several infecting agents were used, there developed in the heart valves, heart muscles and joints, lesions basically similar to those of rheumatic fever. Even subcutaneous nodules were occasionally found.

It would appear that the known predisposing factors in rheumatic fever can be explained on the basis of vitamin C deficiency. Fatigue, loss of appetite, loss of weight, muscle pains, and nervousness are common to both latent scurvy and the early rheumatic state. Rheumatic fever and scurvy are diseases of the temperate zone, and are rarely encountered in the tropics where the natural dietaries are well supplied with anti-scorbutics. Rheumatic fever is 20 to 30 times as frequent in the poor as in the well-to-do. The maximum incidence of first attacks is between the ages of 5 and 12. Children of this age require approximately twice as much vitamin C per kilo for the prevention of latent scurvy as do adults. The greatest incidence of rheumatic fever is in the late winter and early spring following the period during which fresh fruits and vegetables are hard to obtain. A certain number of cases of rheumatic fever follow upper respiratory infections. It is the author's concept that it is a state of latent scurvy that renders the smaller group susceptible to the rheumatic fever.

A scorbutic factor would appear to offer a satisfactory explanation for the hæmorrhagic manifestations of rheumatic fever, and for the location of rheumatic lesions in the heart valves and in the peri-articular tissues. The connective tissue forming the valves and peri-articular structures is poor in quality and unable to stand the strain required of it, because the scorbutic animal is unable to form normal intercellular substances.

Using the determination of capillary strength for the detection of vitamin C deficiency, it would appear that vitamin C deficiency amongst children is so frequent as to be a matter of considerable public health importance. The ability of the body to store this vitamin is very limited, and it would appear that fatigue and certain infections further deplete the body's store. On enquiry into the dietary habits of children in his cardiac clinic, the author found that the majority of the children were on the borderline of inadequate nutrition, and many were severely deficient in vitamin C intake. Capillary resistance tests revealed, in general, low levels, particularly in cases with clinical evidence of recent rheumatic activity.

H. GODFREY BIRD

Surgery

Pathological Changes of Diseased Gall Bladders.

Andrews, E., *Arch. Surg.*, 1935, 31: 767.

According to the author and his associates of the Department of Surgery, at the University of Chicago, the present classifications of cholecystitis are faulty. A total of 116 gall bladders removed at operation were studied. On 54 of the patients operated on elaborate chemical and pathological studies were made. In 61 other

cases chemical, bacteriological, and clinical studies were made, but no sections were studied. Cultures were made both of the bile and of the wall of the gall bladder. Bacteriological studies must not simply demonstrate the presence or absence of bacteria, but must be quantitative. Many pathogenic bacteria are ordinarily present; hence, to be of clinical importance an increase in the normal flow must be demonstrated. Cultures were planned so as to attempt to grow both the aerobic and the anaerobic organisms. The author's experience has indicated that a single section of the wall of a gall bladder is of rather doubtful significance. When general sections are made, it at once becomes clear that asymmetry of two types is frequently encountered. There is a tendency for the sections nearest the fundus to show the most advanced changes. In several of the author's cases there was a high degree of patchiness of the infiltration, which is regarded as evidence that the underlying cause of the lesion is a vascular damage and that it corresponds to areas in which the blood supply is impaired. This was more marked on the hepatic surface of the gall bladder than in the free peritoneal edge. This is believed to indicate that infection, when it occurs, spreads by direct continuity from the liver, which has normally a rich bacterial flora. In no case was it possible to trace any pathological changes to the Rokitsansky-Aschoff sinuses. Ulcers of the gall bladder were excessively rare in Andrews' series. He believes that the thickness of the freshly removed gall bladder is due to œdema of the subserous layers. In his experience empyæma never occurs; the "pus" is really precipitated calcium or cholesterol. He does not place great importance on cholesterosis.

To be of any value to clinicians, a classification of diseases of the gall bladder must be founded on sound ideas of the etiology and especially of the relation of infection to cholelithiasis. He proposes the following classification: (a) Normal state of the gallbladder. (b) Reaction to acute obstruction of the cystic duct. (c) Reaction to intermittent obstruction of the cystic duct. (d) Reaction to chronic obstruction of the cystic duct. (e) Reaction to obstruction of the common duct. (f) Neoplasms. This classification is based on the real factor which influences the development of the pathological picture as well as the course of the disease clinically, the question of the patency of the cystic duct.

G. E. LEARNMOTH

Acute Free Perforation of the Gall-Bladder.

D'Abreu, A. L., *Brit. M. J.*, 1935, 2: 1150.

The delayed treatment of acute cholecystitis gives usually excellent results but unfavourable results occasionally occur. These are fistulous communications with other viscera, the formation

of a pericholecystic abscess, or free perforation into the peritoneal cavity. The latter complication is commoner than is usually thought. The author reports 3 cases in a series of 116 proved cases of gall-bladder disease.

Free perforation occurs most commonly in the elderly. It would seem to occur equally in both sexes. Inflammation of the calculous gall-bladder is the commonest cause. Trauma, typhoid fever, and the presence of *Ascaris lumbricoides* are rare causes. Gangrene is not always present. Large perforations may occur and close spontaneously. Torsion of the gall-bladder may be followed by perforation. The administration of cathartics in acute calculous cholecystitis has been blamed for precipitating rupture. There is no characteristic clinical syndrome. It is rarely diagnosed before operation, and has been confused with all of the ordinary surgical abdominal emergencies. Bile leakage into the peritoneal cavity is not so irritating as gastric contents. The safest guide is ceaseless vigilance during the expectant treatment of acute cholecystitis, particularly in elderly patients. A rise in pulse rate associated with an increase in the area of abdominal tenderness must not be neglected. Jaundice rarely appears.

The main principle of treatment is early diagnosis and immediate laparotomy. Cholecystostomy, plus drainage of Morison's pouch, should be done. As most cases occur in gall-bladders the seat of chronic calculous disease, justification is provided for continuing to advise such patients to have cholecystectomies to prevent this and other serious complications. STUART GORDON

Obstetrics and Gynecology

Vaccination During Pregnancy as a Prophylaxis Against Puerperal Infections: A Preliminary Report. Bernstine, J. B. and Otten, R. E., *Am. J. Obst. & Gyn.*, 1936, 31: 37.

The bacterial strains employed in the vaccine were obtained from pregnant women attending the antenatal clinic of the Philadelphia General Hospital. The vaccine was tested on mice and on non-pregnant women before administering it to pregnant women. The 51 pregnant women who were vaccinated were selected at random from patients attending the antenatal clinics of the Jefferson and Philadelphia General Hospitals. Twelve had presented one or more complications during previous pregnancies and 19 had one or more complications during the present pregnancy. The 51 pregnant women received from three to thirteen injections of the vaccine without untoward reactions. While the average morbidity of the puerperal patients in those two hospitals was 19 per cent, the morbidity of the vaccinated group was 5.9 per cent. There were fifty live births, and one still-

birth from a primipara suffering from pre-eclamptic toxæmia and premature separation of the placenta. There were no abortions or miscarriages among the vaccinated group.

The authors conclude that this type of vaccination should be included in the armamentarium of prenatal care. ROSS MITCHELL

Chronic Hypochromic Anæmia in Women.

Gray, L. A. and Wintrobe, M. M., *Am. J. Obst. & Gyn.*, 1936, 31: 3.

Forty patients with hypochromic anæmia of obscure origin were studied, particularly from the gynecological standpoint. Myomas of the uterus were found in 8, endometrial hyperplasia in 5, and unexplained menorrhagia in 14. Twelve patients gave a history of repeated pregnancies, post-partum hæmorrhage or abortion. There was evidence of excessive demands for hæmoglobin formation in a total of 31 cases (77.5 per cent). Achlorhydria was found in 25 cases and hypochlorhydria in 7 more, a total of 84 per cent of those examined in which some evidence of faulty alimentary function was found. The diet was poor in foods known for their hæmoglobin-building properties in 25 patients (71.4 per cent of those examined).

The etiology of this anæmia is concluded to be usually the result of the operation of one or all of three factors; faulty alimentary function, defective diet, and excessive demands for hæmoglobin. Faulty alimentary function probably impairs absorption of the hæmoglobin-building materials in the diet; a diet which is low in such foods contributes to the relative deficiency. In most women these two factors alone are not great enough to lead to anæmia, but moderately increased demands for hæmoglobin and even the requirements of normal menstruation in some women precipitate the anæmia. The value of large doses of iron, correction of diet, and gynecological therapy is discussed.

Relapse is common in this type of anæmia and is due in most instances to persistence of increased demands for hæmoglobin. Relapse may often be prevented by checking the excessive requirements. ROSS MITCHELL

Pædiatrics

Effect of Vaccination with BCG on Tuberculosis in Infancy and in Childhood. Aronson, J. D. and Dannenberg, A. M., *Am. J. Dis. Child.*, 1935, 50: 1117.

The authors remark that many reports have been published about the value of BCG but the majority of them are based on the total number of infants vaccinated among the general population, with relatively little consideration of the rôle played by contagion. They think that the results of vaccination for tuberculosis, as

for other infectious diseases, can be evaluated only when the degree of exposure to the disease is taken into account. In order to get at a more accurate estimate of the value of BCG they undertook a study of new-born infants residing in families with cases of manifest tuberculosis who were given BCG orally. Infants similarly exposed, but too old to be vaccinated by the mouth, were used as controls. Details are given of the method they employed to grow the Calmette strain of the bacillus tuberculosis and to prepare the vaccine, and of the precautions taken to avoid contamination. Between December, 1927, and October, 1934, forty-three white and 27 coloured infants, from 41 white and 26 coloured families, were given 30 mg. of BCG vaccine by the mouth. As controls 114 white and 53 coloured infants, born during the same period into 89 white and 41 coloured families, were studied. Of 41 children who remained in contact with persons having open tuberculosis and were vaccinated orally with BCG during the first ten days of life, one, or 2.4 per cent, died of tuberculosis, while of 84 unvaccinated children living under comparable conditions 10, or 11.9 per cent, died from the disease. Of 15 children who remained in contact with persons having tuberculosis whose sputum did not contain tubercle bacilli and who were vaccinated with BCG none died of tuberculosis; of 45 unvaccinated children living under comparable conditions 2, or 4.4 per cent, died of tuberculosis. No deaths from tuberculosis occurred in the children studied who were not associated with persons known to have manifest tuberculosis, either among the 14 children vaccinated with BCG or among the 38 unvaccinated ones.

The authors conclude that their results indicate that the administration of BCG to new-born children exposed to patients with manifest tuberculosis may prove of value in reducing the mortality from this disease in infancy and childhood.

JOHN NICHOLLS

Le Syndrome Urinaire et les Fonctions rénales dans les Néphrites Hématuriques des Enfants. Nobécourt, P. and Briskas, S. B., *Arch. d. Méd. d. Enfants*, 1935, 38: 660.

Hæmorrhagic nephritis is relatively common among children. In their clinic the authors treated 26 cases from 1928 to 1935. Nineteen were in boys from three to twelve years of age, and 7 in girls from five to thirteen. The most common etiological factor was rhino-pharyngitis, which was present in 19 of the 26 cases (73 per cent). Less often the nephritis was associated with other conditions, such as an angina occurring after the injection of antidiphtheritic serum, impetigo, and paratyphoid fever (A and B). In 2 no cause could be assigned.

Hæmorrhagic nephritis is more frequent in boys than in girls, and is met with particularly between the ages of six and seven years and, next, from nine to twelve. The clinical course lasts only a few days to a few weeks. Edema is not often met with; it may be obvious or concealed. Nitrogen retention is common; in general, it disappears between the fifteenth and twentieth day. Cardiovascular features are generally unobtrusive. In some cases changes in the blood chemistry were found. Blood cholesterol and the total lipoids are almost always increased at the onset of the illness. They return to normal when recovery occurs. There is no relationship between the amount of cholesterol and that of the urea of the blood. The relative proportion of the various proteins may be upset. The prognosis is generally favourable. Most patients get well in a few weeks or months.

JOHN NICHOLLS

Ophthalmology

Infantile Traumatism According to Data from the Ophthalmic Clinic of the Kiew Institute of Medicine during Twenty-five Years. Chevetchouk, J., *Ann. d'Ocul.*, 1935, 172: 457.

Lesions of the eyes are twice as frequent in boys as in girls, and the objects that most frequently cause injuries are firearms, explosives, arrows, slingshots—dangerous playthings. The age of the boys ranges from 8 to 14 years, and in the great majority of cases (90 per cent) it was the globe that was injured, and in 57.6 per cent there was perforation. In the majority of cases the lesions were of grave order, and in view of the gravity of the lesions the question of such traumatism merits serious attention.

It is necessary to give more attention to children's play and to their education. Reorganization of homes, schools and playgrounds is necessary, also grouping of school-children, for play according to their age. Appropriate talks should be given by the school physician or oculist to the children, parents and teachers. The sale of dangerous toys should be prevented, and children should be supplied with and encouraged to use daily playthings that are interesting, rational and of low price.

S. HANFORD MCKEE

Epidemic Encephalitis and the Organ of Vision. Dvorjetz, M. A., *Ann. d'Ocul.*, 1935, 172: 852.

As now thirteen or fourteen years have passed since the epidemic of encephalitis lethargica we are able to get some idea of the importance of the affections of the visual organ in this condition. This report is made up from a series of 380 cases. Ocular disturbance in the course of epidemic encephalitis is in most cases one of the earliest signs and sometimes these are the only signs noticeable. In rare instances the

eye does not participate at all; in this series, in 5.6 per cent of the cases. All parts of the central nervous system may be affected. The most frequent lesions are found at the level of the aqueduct of Sylvius and on the floor of the fourth ventricle in the zone of the motor oculi nerves. These are the most commonly affected. In rare cases a one-eyed diplopia has been observed. Multiple paralyses of ocular muscles are more common than isolated paralysis. Besides ocular-motor paralysis there were noted, disturbance of convergence, pupillary changes, nystagmus, frequent winking, palpebral tremor, involuntary palpebral spasm. Pupillary disturbances appear quite late and persist longer than other post-encephalitis changes in the eye.

Notwithstanding the opinion of numerous authors, the optic nerve is often affected in epidemic encephalitis. Functional disturbances of the visual organ in the presence of ophthalmoscopic lesions of the optic nerve do not correspond to the ophthalmoscopic modifications.

S. HANFORD MCKEE

Detachment of the Choroid after Cataract Extraction. O'Brien, C. S., *Arch. Ophthalm.*, 1935, 14: 527.

Detachment of the choroid after cataract extraction occurs, so far as can be determined, almost invariably at the time of operation. It is due to the reduction of intraocular pressure, with subsequent congestion of the uveal vessels, and a rapid and exaggerated transudation of fluid from the thin-walled veins of the ciliary body and anterior choroid into the normal perichoroidal lymph space. Large detachments follow delayed closure or rupture of the wound. The prognosis is good. The choroid invariably resumes its normal position and central visual acuity remains unaffected. The visual fields in a number of cases some weeks after operation were found to be normal. Treatment consists in an effort to promote closure of the wound.

S. HANFORD MCKEE

Urology

A Consideration of Testicular Prosthesis. Barney, J. D., *J. Urol.*, 1935, 34: 453.

An American surgeon, Hermance, was the first to conceive and execute the idea of implanting an artificial testis. Subsequently, French surgeons took up the idea and, in all, the author was able to find 19 case reports. Paraffin, celluloid and silver were the substances most frequently employed, although glass, marble, silk, vulcanite, ivory and rubber are mentioned. The greater number did well, though some had pain, tenderness and sinus formation, but it is to be noted that there were no untoward reactions in any case where celluloid or silver were used.

The operation was carried out for a variety of reasons. In the "gay nineties" when bilateral castration was done for the relief of prostatic obstruction there was a demand for cosmetic perfection; other cases were done for cryptorchidism and following orchidectomy for tumour, tuberculosis, etc. The important point was that in many of these cases there was profound mental derangement occasioned by the empty half or completely empty scrotum and in all complete restoration followed the operation.

Hermance's case was a man, aged 21, with unilateral cryptorchidism. Because of his desire to marry and fearful of his sexual ability he had become seriously deranged. A model was made of a piece of raw potato and reproduced by a craftsman in silver. The operation was a complete success; mental equilibrium was restored; he married and had two children. The author's case was a man of 29, musician, well educated. Five years previously an atrophic undescended testis had been removed. He had become very perturbed and at times was on the verge of suicide. Whereas formerly he was athletic, a good mixer, and ardent lover he now felt all eyes were focussed on the empty half of his scrotum, and he could no longer carry on. He had tried many surgeons, but was unable to get an artificial testis. The author got a silver ball about one inch in diameter and implanted it into the remains of the tunical sac. Recovery was uneventful. The patient's mental balance was completely restored, he became optimistic, and returned with increased enthusiasm to his former pursuits, was social, athletic and amorous. N. E. BERRY

Suppurative Orchitis, Its Diagnosis and Treatment. Mathe, C. P., *J. Urol.*, 1935, 34: 324.

The author in a careful perusal of the literature emphasizes the fact that although epididymitis, epididymo-orchitis, and orchitis frequently occur, suppuration of the testis is relatively infrequent. This is due in part to the rich blood and lymph supply of the testis and to the protection offered by the tunica albuginea. Attention was drawn to the embryological consideration of the testis as an excretory organ like the kidney.

Infections of the testis take place through the blood stream, lymph channels, natural channels by way of the vas, and might be due to torsion of the cord, to trauma of the testis during operation, and to toxic poisoning. They are more prone to occur in patients presenting genito-urinary infections in general.

The important points in diagnosis of suppurative orchitis are persistent fever, leucocytosis, progressive swelling, pain and tenderness of the testis, fluctuation. The author emphasizes early diagnosis at the time when the greatest amount of testicular tissue may be preserved by prompt operation, consisting of incision and drainage.

A case is reported of the fulminating type of testicular abscess due to the *B. coli*, occurring in a young patient with an upper urinary tract infection following instrumentation of the urethra.

V. J. BERRY

Neurology and Psychiatry

The Frontal Lobe in Man: A Clinical Study of Maximum Removals. Penfield, W. and Evans, J., *Brain*, 1935, 58: 115.

Animal experimentation contributes little to advance in knowledge of the functions of the frontal lobes, as all animals possess only rudimentary pre-frontal development and it is, further, impossible to explore their finer thought processes. The authors relate their observations in three cases of radical removal of large portions of one frontal lobe. All three of these cases presented unusual opportunity for study before and after operation, and the excised portions of the brain could be accurately examined. A routine examination of any of these three patients after recovery from operation would not have revealed any abnormality. After a radical removal of the left frontal lobe in an adult male all that could be said was that he had lost something which psychometric examination did not evaluate; he had lost part of his initiative. The largest of the three removals—an extirpation of the right frontal lobe in a middle-aged woman—is reported in greater detail. After recovery from her operation physical examination was negative and there was no change in personality or capacity for insight, but there remained an important defect—a lack of capacity for planned administration or power of initiative. She had become incapable of discerning for herself possible courses of action so that she might choose. If others presented to her the possibilities she made up her mind easily, and when the task lay before her there was no reluctance nor hesitation in undertaking it. In the third case removal of half of the right frontal lobe in a boy of 19 years produced no detectable loss of function.

FRANK TURNBULL

Tuberous Sclerosis Diagnosed with Cerebral Pneumography. Berkowitz, N. J. and Rigler, L. G., *Arch. Neur. & Psych.*, 1935, 34: 833.

These authors present a case of tuberous sclerosis, with epilepsy, in which the tumours were visualized by means of roentgenograms taken after the ventricles had been injected with air. The family history is of interest inasmuch as the father of the patient and one of his brothers and one of his sisters had also had epileptiform seizures. The authors make no suggestion that these may have been associated with tuberous sclerosis in these persons, but the conjecture is not without validity. The father was one of ten children whose parents were mentally

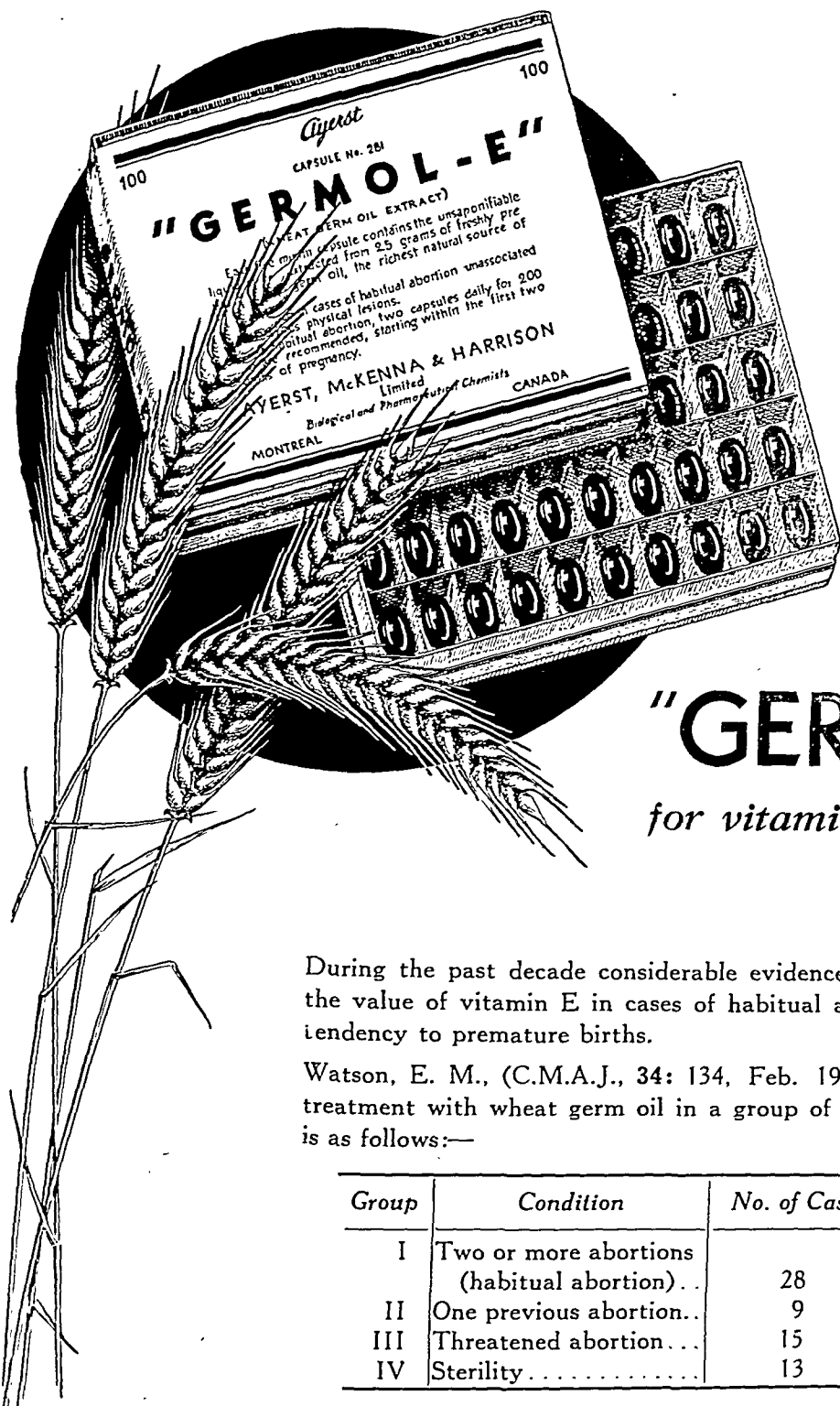
sub-normal and had been on county relief for years. None of the ten ever succeeded in getting beyond the 8th grade, and only four of them ever reached it. The father of the patient married a woman who had never been able to progress beyond the third grade. They had four children; the first dying at 12 days of pneumonia and malnutrition; the second, a girl showing bilateral hare lip and cleft palate, subject to epileptiform seizures, and exhibiting four tumours projecting into the ventricles of the brain when pneumography was carried out, and having an intelligence quotient of 52; the third, a girl physically normal, with an intelligence quotient of 55, a pneumogram which might be suggestive of tuberous sclerosis, but considered normal by the authors, inasmuch as she had had no evidence of convulsions, so that the picture might be regarded as within the limits of normal; and finally, the fourth child, a boy with bilateral hare lip and cleft palate, dying at the age of 4 months of some undiagnosed condition. The above family history presents evidence of inheritance of hare lip and cleft palate, of mental retardation, and of some anatomical defect which is at the basis of the epileptiform convulsions. There is the possibility that this anatomical defect is a condition of tuberous sclerosis.

Note.—Up to 1910 29 cases of tuberous sclerosis have been reported, and of these 20 had a family history of the condition. Berg (1913) reported it through three generations, and Fabing, (1934) found it in identical twin girls.

MADGE THURLOW MACKLIN

Scalenus Anticus (Naffziger) Syndrome. Ochsner, A., Gage, M. and De Bakey, M., *Am. J. Surg.*, 1935, 28: 669.

The symptoms in cervical rib and scalenus anticus syndrome are the result of compression of the brachial plexus and subclavian artery. Normally, during the intra-uterine and pre-adolescent development the acromial end of the clavicle and shoulder descend because of the weight of the upper extremity, and the sternal end of the clavicle descends because of the contraction of the rectus abdominus muscle exerted through the sternum. Greater descent of the shoulder or an arrested descent of the sternum will result in stretching of the brachial plexus and subclavian vessels over a fixed cervical or first dorsal rib. Irritation and stimulation of the brachial plexus by pressure on the first rib cause spasm and shortening of the scalenus anticus muscle, thus establishing a vicious circle. The scalenus anticus syndrome occurs more frequently in women than in men, and the lesion is usually on the right side. Pain is the principal symptom and is referred to the shoulder, supra-clavicular region, down the arm, ulnar and flexor surfaces of forearm to hand, and frequently to the side of the neck and ear. Vascular mani-



A NEW
Ayerst
PRODUCT

"GERMOL-E"
for vitamin E therapy
in pregnancy

During the past decade considerable evidence has been presented to show the value of vitamin E in cases of habitual abortion and where there is a tendency to premature births.

Watson, E. M., (C.M.A.J., 34: 134, Feb. 1936) reports results following treatment with wheat germ oil in a group of 65. The summary of results is as follows:—

Group	Condition	No. of Cases	Successes	Failures
I	Two or more abortions (habitual abortion) . .	28	21	7
II	One previous abortion . .	9	8	1
III	Threatened abortion . .	15	11	4
IV	Sterility	13	0	13

Ayerst "Germol-E" is made from wheat germ oil, the richest natural source of vitamin E. Each five minim capsule contains the unsaponifiable liquid matter extracted from 2.5 grams of freshly prepared wheat germ oil.

In boxes of 50 and 100 capsules.

AYERST, McKENNA & HARRISON LIMITED
Biological and Pharmaceutical Chemists
MONTREAL CANADA

festations consist of diminution of the pulse volume on the affected side, decrease in surface temperature, numbness, coldness, and formication. The vascular manifestations are much less prominent than are the nervous symptoms. The scalenus anticus syndrome must be differentiated from cervical rib syndrome, subacromial bursitis, supraspinatus tendon rupture, cervicodorsal sympathalgia, Raynaud's disease and brachial plexus neuritis. Treatment consists of resection of a portion of the lower end of the scalenus anticus muscle. The results of this operative procedure are uniformly good.

FRANK TURNBULL

Therapeutics

Further Studies in Calcium and Parathyroid Therapy in Chronic Ulcerative Colitis. Haskell, B. and Cantarow, A., *Am. J. M. Sc.*, 1935, 190: 676.

The method of treatment described in 1931 by these authors included, (1) a cellulose-free non-irritating diet, (2) such drugs as belladonna and kaolin, and (3) calcium gluconate in drachm doses, 3 to 4 times daily, four hours after meals. Parathyroid extract was given intramuscularly in doses of 20 units every two to three days. The treatment was continued from one to three months. Of 9 patients under observation for periods of two to six years after their original course of treatment, 5 had remained essentially symptom-free, brief remissions occurred in 2 instances and the other 2 contracted intercurrent disease. Of 16 additional patients treated similarly since the first published report, 8 became clinically well, 7 were restored to fairly normal health, and only 1 was not improved.

The clinical use of calcium and parathyroid extract brings about prompt cessation of bleeding and relief from colonic spasm and hyperirritability. The cessation of bleeding is considered to be an important factor in the healing of the ulcers. Marked reduction in pain and in the frequency of the stools was noted in several cases in which full doses of belladonna had been ineffectual.

The rationale of calcium therapy in chronic ulcerative colitis is believed to rest upon the favourable influence of calcium upon (a) nutritional changes in the tissues, with or without a disturbance of calcium partition, (b) spasticity and hyperirritability of the colon, and (c) slow capillary bleeding.

E. S. MILLS

Diathermy in Lobar Pneumonia. Preliminary Report. Wetherbee, W., Foley, J. A. and Resnik, J., *New Eng. J. Med.*, 1935, 213: 796.

In Boston City Hospital in the winter of 1934-35 a series of 36 consecutive patients with lobar pneumonia were given the standard treatment for this disease, including serum and/or oxygen when indicated. In addition one-half of

the patients, alternately chosen, were given physiotherapy in the form of diathermy. The mortality for the entire series was 22.2 per cent; that of the diathermy group 11.1 per cent, and that of the control group, 33.3 per cent. Because of the lower mortality in the diathermy group, and because of the very definite subjective improvement in the patients treated by this method, the authors feel justified in continuing with this form of treatment until a sufficiently large number of cases, with controls, has been accumulated to draw more definite conclusions.

LILLIAN A. CHASE

Pathology and Experimental Medicine

The Urinary Concentration in Diabetes Insipidus—A Comparison of the Effects of Several Drugs. DeGowin, E. L., *Am. J. M. Sc.*, 1935, 190: 747.

DeGowin has studied the effect of various drugs upon the urine output and specific gravity in two cases of diabetes insipidus. A standard test was devised by him with a view to eliminating the factor of thirst. The test period ran for 48 hours, starting at 6 a.m. At that time, and at 2-hour intervals, the patient drank 200 c.c. of water and emptied the bladder. A placebo was given at 10 a.m. the first day, and the trial drug at the same hour the second day. The meals served were identical. The two-hour samples of urine were examined for colour, specific gravity, and total volume. In both cases it was found that by far the most effective drug was powdered posterior pituitary substance given in a 0.05 g. dose, intranasally. Other drugs effective, though less so, were pitressin (1 c.c. hypodermically) and amidopyrin (2 g. orally). The author cautions against the free use of amidopyrin, as it is known to be a cause of agranulocytosis.

E. S. MILLS

Bacteriology of Normal and Diseased Gall-Bladders. Andrews, E. and Henry, L. D., *Arch. Int. Med.*, 1935, 56: 1171.

Although there has been much discussion as to which organism is most often implanted in gall-bladder disease the authors raise the question as to whether organisms play as important a part as has been assigned to them. Apparently the cultures from the contents are often sterile; also the wall yields positive cultures more frequently, lymphoid tissue being a filter of bacteria. The material for this article was 91 gall-bladders with their contents removed surgically and, being protected in every way from contamination, cultured in every possible manner. They included (1) normal or quiescent organs, (2) the same with stones, (3) from patients with obstruction of the common duct, (4) and (5) from patients operated on in active and quiescent states of the disease.

Detection...

Diagnosis of

Bone Lesions

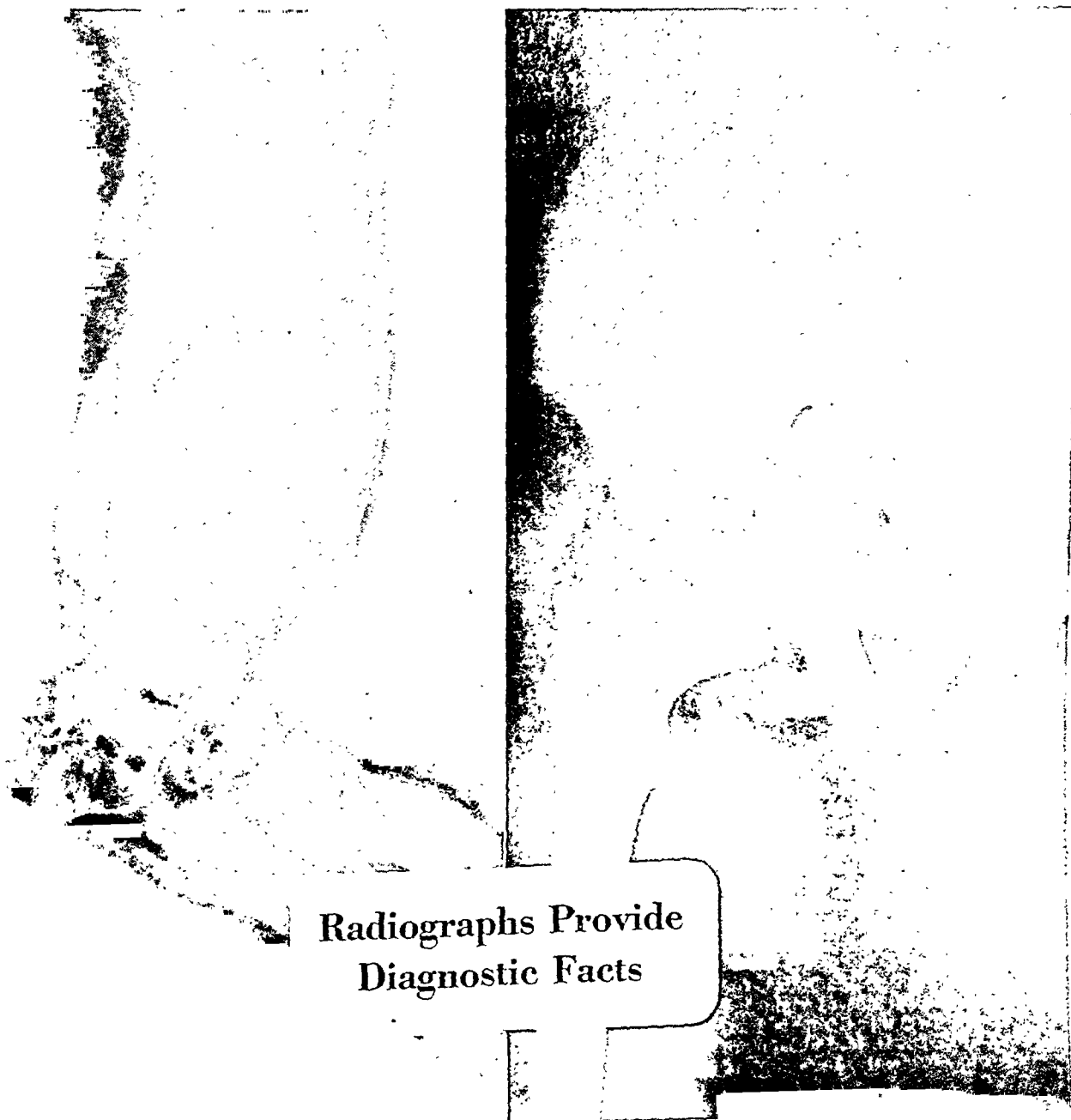
THE clinical signs in many types of bone pathology are so similar that differentiation and early diagnosis, based upon such evidence alone, often are impossible.

Radiographically, however, various bone diseases show definite characteristics. In these cases radiographs are invaluable in making the early diagnosis so necessary to effective treatment. The

x-ray examination discloses minute changes in bone architecture, thus indicating the true pathology—such as tuberculosis, osteomyelitis, sarcoma, lues, malignant metastases, periostitis.

In all cases of suspected bone disease or bone trauma, refer the patient to your radiologist for an x-ray examination. Do not omit this essential to correct diagnosis.

CANADIAN KODAK CO., LIMITED, Toronto, Ontario



**Radiographs Provide
Diagnostic Facts**

The bile was sterile more often than the walls of the bladders—67 to 51 per cent. Why is it sterile to culture? Not because of any bactericidal power in the bile. Except for members of the colon group, which, if found, were always in overwhelming numbers, the number of bacteria was very small and about the same in both normal and diseased organs. Patients with obstruction of the common duct gave rich growths of organisms—suggesting stasis as a great ally.

of bacterial growth. Cultures from 16 cases operated on during or soon after an acute attack were sterile. Thus there seems to be no constant relation between the clinical or pathological state and the presence of bacteria in large numbers. If not bacteria, what is the cause of disease? The authors are inclined to say, mechanical causes such as pressure, obstruction and alongside vascular, toxic and chemical factors.

P. M. MACDONNELL

Obituarics

Dr. Azarie Eugène Bedard died on December 10, 1935, in Quebec, at the Sacred Heart Hospital, at the age of 72. He had been inspector of the Service de l'Assistance Publique for many years. He graduated from the University of Laval, Quebec, in 1892, and practised first at Loretteville and then at Saint Malo. In 1906 he studied in Europe and then returned to enter the service of the Sacred Heart Hospital, where he served on the staff until 1921, when he took over his position with the Service de l'Assistance Publique.

Dr. Joseph Eusebe Bergeron, of Montreal, died on December 11, 1935. He was born in 1854, and was a graduate of Laval University Medical School of Montreal (1880). His wife was Eugénie Ducloux and predeceased him eleven years ago. He leaves a daughter, Marie Blanche; three sons, George, of Toronto, Roch and Adrien, of Montreal.

Dr. Caroline Sophia Brown, one of the first women physicians in Toronto, and a former member of the board of education, died on January 11, 1936, at the age of 73 years. Born at Derry West, Peel County, she was educated in the public schools, Jarvis Collegiate, Toronto, and at Brampton Collegiate, and started her career as a school teacher in Halton County. She later taught in Alexander Muir, Ogden and Queen Victoria Schools, Toronto. While a teacher she put herself through her medical courses. She graduated from Trinity University medical school in 1900, afterwards taking post-graduate work in Dublin, Ireland, and in London, England. She had practised in Toronto for more than 25 years, and was on the Women's College Hospital for a long period.

For ten years she was a school trustee, and was the first woman to gain a chairmanship in that body. Among her many activities she was a founder and former regent of Sir William Osler Chapter, I.O.D.E.; member of the Local Council of Women, of the Home and School Council, a member of Ward Five Liberal-Conservative Association.

Dr. Brown attended the coronation of King George in 1910, and had also represented the board of education at the League of Empire Triennial Conference. She was interested in St. John Ambulance Corps, the Big Sister Movement, Lady True Blues and other branches of the Orange Association, the Canadian Girl Guides, and during the Great War was an energetic worker in recruiting and soldier welfare. She was a member of Dovercourt Road Presbyterian Church.

Dr. Brown is survived by two sisters, Mrs. Elmer Gibson, Yorkton, Sask., and Mrs. Sarah Shoop, in California, in addition to several nieces and nephews.

Dr. Duncan MacIntosh Chisholm. Shortly before the sun went out of sight below the silvery horizon of beautiful St. George's Bay, on Sunday, December 29, 1935, Dr. D. M. Chisholm, of Port Hood, N.S., went forth, confidently, I am sure, to meet his Maker.

Dr. Chisholm was born in the district of St. Andrews, Antigonish County, in the year 1852. From St. Andrews' Grammar School he entered St. Francis Xavier University, Antigonish, remaining there until 1874. He graduated in medicine at the University of New York in 1882. Two brothers predeceased him, the Rt. Rev. Monsignor Colin Chisholm, who for almost three score years was rector of St. Peter's Parish, Port Hood, and John Chisholm, barrister, late Assistant Deputy Minister of Justice, Ottawa. Three brothers survive, William and Alexander, of Edmonton, Alta., and Archibald in California. Sir Joseph Chisholm, Chief Justice of Nova Scotia, is a cousin.

In 1887 Dr. Chisholm married Elizabeth Walsh of Guysboro, N.S. There were five sons and three daughters, all surviving, with the exception of Gregory, of the Halifax Customs Staff, who died in October, 1935. Those living are Sr. St. Raphaelia, Pictou; Mrs. Catherine MacDonald, Roxbury, Mass.; Mrs. Alice Vines, Montreal; Rev. J. C. Chisholm, Antigonish; Duncan, Ottawa; John, Port Hood; Colin, Kirkland Lake, Ontario; and Joseph, Sudbury, Ontario.

After a short time spent at the Strait of Canso, Dr. Chisholm settled in Port Hood where for more than fifty years he carried on an ethical and successful general practice. Duncan MacIntosh Chisholm practically "died in harness", without a doubt the most worthy and honourable death possible to anyone. He possessed a finely trained mind, a character and personality which elicited the respect, admiration and affection of all who were at any time associated with him. He was an excellent diagnostician and consistently despised anything that savoured of quackery, either within or without the profession. Throughout the years he devoted his time abundantly, and generally without remuneration, to the relief of suffering. Always at the beck and call of the public, he travelled about day and night administering to the sick—the mighty and the lowly—the rich and the poor receiving the same recognition. No human followed more closely the footsteps of the Gentle Master in "going about and doing good". His life was literally filled with good deeds, and it is not possible for any one individual to enumerate the hundreds of lives either saved directly or relieved of suffering by his unaided efforts. It is sufficient to say that Dr. Duncan Chisholm's death leaves a vacancy difficult indeed to fill and a memory which will long endure. From the placid waters of Mabou Harbour to the rugged hills of Creignish hundreds will think of him daily and will visualize him in the resting place of the faithful servant. —Contributed.

Dr. Henry Wendall Ambrose Colborne, widely known physician of Wingham, Ont., succumbed to a sudden heart attack on January 28, 1936, at the age of 42 years. He was born at Goderich, educated there and at Queen's University, but finally graduated in medicine at Western University, London (1922), taking post-graduate work at Indianapolis. During the Great War

cholagogue that is exceptionally effective, indicated in all cases of liver disturbances, acute or chronic icterus, except those of a syphilitic nature, or those where surgical intervention is necessary. Also indicated for chronic cholecystitis, etc.

Mode of Use:

One to three teaspoonfuls of granules dissolved in half a tumbler of tepid water, to be taken 30 minutes before breakfast.

*Literature and samples
on request.*



Soluble
granules
125 grammes.

A S O L

The BISMOL LABORATORY MONTREAL

DISTRIBUTORS

TORONTO: Drug Trading, National Drug & Chemical Co. Limited.
MONTREAL: Lyman's Limited, National Drug & Chemical Co. Limited.
WINNIPEG and REGINA: National Drugs Limited.
CALGARY and EDMONTON: Alberta National Drugs Ltd.
VANCOUVER: B. C. Drugs Limited.
HALIFAX and ST. JOHN: National-Canadian Drugs Ltd.

he went overseas with No. 7 Canadian General Hospital. He commenced practice at Blyth, Ont., but subsequently purchased a practice in Wingham, where he had been very successful. He was a member of Wingham Lodge A.F. and A.M., and of Wingham United Church. His wife, Ola Hensley Colborne, and two young children, James Bruce and Robert Brady; his mother; four sisters, Florence and Nellie Colborne, Goderich; Gwendolyn, Toronto; Mrs. A. B. Vail, Washington, D.C., and his brother George, Toronto, survive.

Dr. Robert Samuel Frost, of Kinmount, Ont., and a pioneer physician of Haliburton County, died at his home on January 24, 1936. Death was due in part to an injury received two weeks previously, when he fell and fractured his hip. Dr. Frost had practised in Kinmount continuously for the past 54 years. He was born in 1851, one of the seven sons of the late Mr. and Mrs. Thomas Frost, of Roseneath. He taught school for a time in Northumberland County, later attending Victoria University and the Toronto Medical College where he graduated in 1882. Adhering to the traditions of the "country doctor", Dr. Frost never turned down a call because of a patient's lack of funds, many times travelling on horseback and snowshoe over northland trails to minister to sick people.

Dr. Willard Edgar Johnson, for the past eight years physician for the staff and guests of the Mount Royal Hotel, Montreal, died on January 30, 1936, in the Western Division of the Montreal General Hospital of pneumonia following an operation. He was 33 years old, and a graduate of McGill University (1926). Dr. Johnson was the nephew of Drs. William and Howard Reilly, of Montreal. His parents live in Almonte, Ont. Although he was only a young man, Dr. Johnson was already a member of the medical staffs of the central and western divisions of the Montreal General Hospital and of the Royal Victoria Hospital.

Dr. Joseph Aloysius Kearns, of Phelpston, Ont., died on December 3, 1935. He was a graduate of the University of Toronto (1910).

Dr. A. E. Kelly, a pioneer medical practitioner in Swift Current, Sask., died at his home at the age of 55. He was born in Grey County, Ont., in 1880 and graduated from McGill in 1906. In the early days he served a wide southwestern Saskatchewan area. For some time he was local Canadian Pacific Railway medical officer. Dr. Kelly was a member of the first Medical Council of Saskatchewan, organized in 1909. He was largely instrumental in obtaining from the Canadian Pacific Railway the local hospital site and did much toward organization of municipal hospital facilities. He leaves a wife, a son and two daughters.

Dr. John Alexander Lawson, of Brampton, Ont., died suddenly at his home on January 17, 1936, in his sixty-fifth year. Confined to his home for many years from a lingering illness, Dr. Lawson had been able to carry on a part of his practice, and his duties as Coroner. He presided at the last inquest held in Brampton.

Dr. Lawson was born in the Township of Toronto Gore and educated in Brampton High School and Toronto University, where he graduated with honours (1894). Shortly after his graduation he commenced the practice of his profession in Brampton, and established a very extensive practice in town and county, which he maintained until failing health prevented its continuance. In 1909 he was appointed Coroner for the county of Peel, the duties of which office he discharged with judg-

ment and foresight. In younger days he was a lover of sport and became an active member of local clubs.

The surviving members of the family are his widow, formerly Miss Jean Anderson, of Brampton; two daughters, Shirley and Helen, of Brampton; three sisters, Mrs. A. Queen, Brampton; Mrs. R. J. Hunter, Toronto, Mrs. (Dr.) H. C. Skinner, of Guelph; and three brothers, Dr. J. Lawson, W. T. Lawson and G. H. Lawson, all of Toronto.

Dr. John D. Leeson, of Aylmer, Ont., died on January 29, 1936, after an illness of eight weeks. He had been in ill-health for two years but was able to continue his practice until some weeks before his death.

He was a son of the late Francis Leeson and Mary Leverton and was born on the Leeson homestead, south of Summer's Corners. He attended the Summer's Corners Public School, and after graduating from the Aylmer High School attended Model School in St. Thomas and for several years taught at Yarmouth Heights. In 1903 he graduated with honours from the medical school of Toronto University, and for four years practised medicine at French River, in northern Ontario, where he married Olive Fraser, who survives him.

In 1907 Dr. Leeson purchased the practice and home in Aylmer of the late Dr. Charles W. Marlatt, and for nearly thirty years had been a successful physician in this community. He was medical officer of health for the Township of Malahide for many years, and was an adherent of St. Paul's United Church.

Besides his widow, three children survive: Miss Jean Leeson, medical student at Toronto; and twin sons, John and Paul, at home; four sisters, Mrs. Grant Summers, Summer's Corners; Mrs. (Dr.) Jesse Arnup, Toronto; Mrs. Bertha Harp, Aylmer, and Mrs. Lee Miller, Aylmer.

Dr. Stephen Henry McDonald, of Saint John, N.B., died of coronary thrombosis at St. Joseph's Hospital, Saint John, on February 4, 1936, in his fifty-eighth year. He had suffered the first attack about one week before while giving an anæsthetic. Dr. McDonald was born August 27, 1878, in Saint John. Educated in the public schools, he took his B.A. degree from St. Joseph's University and graduated in medicine from McGill in 1903. In 1928 he was granted an M.A. degree by St. Joseph's University. Practising since graduation in his native city of Saint John, Dr. McDonald had been for many years senior physician to the Saint John General Hospital and Chairman of its medical board. For some years he was Chairman of the Board of Commissioners of the Saint John Tuberculosis Hospital, and had also been an active member of the staff of St. Joseph's Hospital. For more than twenty years he had been physician to the Monastery of the Good Shepherd and to the Mater Misericordie Home. Dr. McDonald was past-president of the Saint John Medical Society, the New Brunswick Medical Society, and of the Council of the College of Physicians and Surgeons of New Brunswick. For the last ten years he has been the Registrar of the Council, and in this capacity has been largely instrumental in securing the one hundred per cent paid-up registration of the medical profession in the New Brunswick Medical Society.

Dr. McDonald was a devoted Roman Catholic and a charter member of the Saint John Council of the Knights of Columbus, a staunch Conservative, and had served as Past-President of the Saint John Saint Patrick Society. Dr. McDonald is survived by his wife and two children.

AN APPRECIATION

"Steve" McDonald has left a host of friends and no enemies. He is remembered as a jovial, big-hearted,

Mar. 1936]

THE CANADIAN MEDICAL ASSOCIATION JOURNAL

MODERN ACHIEVEMENT

Barramack Dam, N.S.W., Australia, holding $33\frac{1}{2}$ billion cubic feet of water
 spanning a gorge 40 miles long: a notable modern achievement.



LONDON HOSPITAL CATGUT IS AN ACHIEVEMENT OF MODERN BRITISH RESEARCH AND LABOUR.
 Vide Medical Research Council Reports

Specify
LONDON HOSPITAL CATGUT
 Obtainable from MESSRS. DOWN BROS. LTD., AGENTS FOR CANADA
 143 College Street, Toronto

Telegrams: Downbro Toronto

Telephone: Waverley 9245

broad-minded physician, with a penchant for kindly actions, a soul full of charity, expressed alike in deed and word. He was congenial and out-spoken in his opinions, a warm friend, a wise mentor, and a facile raconteur. He was possessed of a fund of local historical reminiscences, and his ready wit and gifted Irish tongue made him a welcome companion in many circles. Medical hospitality in Saint John has, for many years, born the imprint of Steve McDonald's master hand in the arrangement of outstanding menus, prepared for the delectation of our guests and ourselves. Visitors to the Canadian Medical Association meeting in Saint John in 1933 were privileged to partake of his best efforts in the line of Atlantic sea-food dinners. Our genial friend brightened many hours for all of us. We wish him a pleasant voyage on his last long journey, and may we some day be privileged to meet again this lovable Canadian gentleman.

A. STANLEY KIRKLAND

Dr. David Harvey Nichol, Chief Medical Officer at Westminster Hospital, and for many years in the medical service at Queen Alexandra Sanatorium, London, Ont., died on February 2, 1936, at the hospital. He had been ill for two months.

Dr. Nichol had been connected with the hospital since its establishment in 1920, and for the past two years had been the Chief Medical Officer. He was an overseas man, having seen service with the Queen's University contingent in France and Egypt. His entire career was spent in the Government medical service.

Dr. Nichol was born at Atwood, Perth County, but passed his early life in Owen Sound.

He returned from overseas to complete his course at Queen's in 1919. Following his graduation he was retained in the Government service as a Department of Soldiers' Re-establishment medical officer at Queen Alexandra Sanatorium. Dr. Nichol was also medical officer to the 2nd Machine Gun Battalion, with the rank of Captain. He was an active member of the London Curling Club, the Highland Golf Club, and an enthusiastic lawn bowler on the Westminster greens. He was a member of the London Canadian Club and of Metropolitan United Church; was a Mason, member of Tuseau Lodge, No. 195.

Dr. Nichol married Miss Ora White, who, with two daughters, Jean and Mary, and one son, David, survives him.

Dr. Jefferson Tilden Novinger, of Montreal, died on January 20, 1936. Dr. Novinger was born in Missouri on November 6, 1877, son of George and Mary Novinger. His father was a farmer originally, but rose to a position of importance in the community and state, and ended his career as a county judge.

Dr. Novinger graduated with his M.D. degree in 1903 from the Hahnemann Medical College, Chicago, Ill. He had previously been a student at the Missouri State College. For a year he served as an intern at Hahnemann Hospital in Chicago and in 1904 came to Montreal where he established his residence, becoming Chief Surgeon at the Montreal Homœopathic Hospital.

In 1913 he married Florence Johnston, of Jamestown, N.Y., who with three children, all born in Montreal, survives. The children are George Tilden, Donald Yates and James Ogden Novinger.

Dr. Claude Owen Reist, of Preston, Ont., died on January 29, 1936, in a Kitchener hospital, after an operation for appendicitis. Dr. Reist was an alderman of Preston and coroner. He was 40 years of age, was born in Waterloo Township and had practised in Preston for sixteen years, and previously in Collingwood and Tavistock.

Dr. Reist was a graduate of Queen's University (1919) and enlisted from there in the medical corps in 1915 and was stationed in Egypt.

He is survived by his wife, mother, two brothers and one sister.

Dr. Peter B. Robertson, of Windsor, Ont., died on December 25, 1935. He was born in 1864, and was a graduate of Trinity University (1891).

Dr. George W. Somerville, of Bristol, N.B., died on January 14, 1936. He had attended to his practice up to the time of his death. Dr. Somerville was a native of Kings County, and had practised in Bristol for forty-two years. He was a graduate of the College of Physicians and Surgeons, Baltimore (1893) and of the Jefferson Medical College (1894). Dr. Somerville was a real "country doctor". His maternity books show that he attended five thousand births, which is a very large number when one considers that his practice was almost entirely rural.

Dr. Charles Carlyle Tatham, of Edmonton, Alta., died at Midland, Ont., on December 25, 1935. He was born in Listowel, Ont., and was a graduate of the University of Toronto (1900). He is survived by his son Jack, of Sudbury.

Dr. Maurice Ernest Thomas, of Toronto, died in December, 1935. He was born in 1897 and a graduate of the University of Toronto (1922).

News Items

British Columbia

H. M. Cassidy, Ph.D., Director of Social Welfare for British Columbia, in an address before a public meeting in Victoria stated that health conditions in British Columbia are so bad as to constitute a social disgrace, and that in view of the modern means of hospitalization and modern medical science there is far too much preventable ill-health. Speaking further in support of health insurance, Dr. Cassidy quoted figures from a government survey of school-children in a city of the province to the effect that 94.5 per cent of the children examined had defective teeth, and said that he had good reason to believe that a similar situation would be found in other city schools. One of the barriers to obtaining proper medical treatment was found in the fact that in 1933 62 per cent were receiving less than \$1,000 a year and 90 per cent less than \$1,800. This was taken as evidence that inability of wage-earners to pay the cost of medical treatment was responsible for much of the ill-health in the province today. Dr. Cassidy's conclusion was given in his opinion that "the buying of medical attention on the individual purchase plan stands condemned as an antiquated system and will not work".

Dr. J. W. McIntosh, City Health Officer, Vancouver, reported at the first of the year that the decrease in the incidence of diphtheria since the general introduction of toxoid immunization early in 1930 has continued during 1935. In the past year there were only 9 cases, occurring chiefly among a group of Chinese and Hawaiian adults. This is a reduction of 98.4 per cent from the figures up to 1930. In 1934 there were 19 cases caused by an outbreak among pre-school-age Japanese children who had not received toxoid. Since the use of toxoid was started there have been only two mild cases of diphtheria in children who had received toxoid.

Among the changes in staff in the Vancouver General Hospital at the commencement of the year Dr. B. D. Gillies was made Chief of the Staff, and the position of

CONTAINS
THE
ESSENTIAL

MINERALS

SODIUM
POTASSIUM
PHOSPHORUS
CALCIUM
IRON
MANGANESE

During Pregnancy and the Postpartum Period

supporting treatment is essential. Fellows' Syrup is the most logically prepared tonic at the disposal of the physician.

It contains all the required minerals in correct proportion and in an easily assimilable form. These are Manganese and Iron to renew the blood stream impoverished by continued loss; Calcium to replenish the constant calcium depletion; Potassium, Sodium, and Phosphorus to overcome the neural depression; Strychnine as a tonic to cell metabolism; and Quinine as a gastric stimulant.

There is no better tonic than Fellows' Syrup to the parturient and postparturient patient. During these trying periods, the suggested dose is one teaspoonful three times daily well mixed with water.

SAMPLES ON REQUEST

FELLOWS MEDICAL MFG. CO., LTD.

286 St. Paul Street, West, Montreal, Canada.

FELLOWS' SYRUP

OF THE HYPOPHOSPHITES

OVOL'S are

SPECIALLY DESIGNED
UNMARKED
UNCOLOURED TABLETS OF
ACETYSAL. AND COMBINATIONS.

OVOL "APCC"

Acetylsalicylic Acid.....	3½ grs.
Phenacetine.....	2½ grs.
Caffeine Citrate.....	½ gr.
Codeine Phosphate.....	⅛ gr.

OVOL "APC"

Acetylsalicylic Acid.....	3½ grs.
Phenacetine.....	2½ grs.
Caffeine Citrate.....	½ gr.

OVOL "A"

Acetylsalicylic Acid.....	5 grs.
---------------------------	--------

OVOL "APCC2"

Acetylsalicylic Acid.....	3½ grs.
Phenacetine.....	2½ grs.
Caffeine Citrate.....	½ gr.
Codeine Phosphate.....	¼ gr.

No packages for laity demand. In bottles of 100 and
500 Tablets only. Request literature and samples.

Manufactured by

FRANK W. HORNER LIMITED
MONTREAL - - CANADA

Chief of the Medical Services, held with distinction by Dr. Gillies for the past five years, was filled in turn by Dr. G. Lyall Hodgins. Dr. G. F. Strong replaces Dr. Hodgins as head of the Out-patient Department. Dr. C. F. Covernton fills the post of Chief of Pediatrics, vacated by Dr. E. D. Carder upon his retirement. Dr. G. E. Seldon has replaced Dr. P. A. McLennan as Chief of the Surgical Services.

Representatives of the College of Physicians and Surgeons of British Columbia conferred with Hon. G. M. Weir on the proposed Health Insurance Act in Victoria on January 25, 1936. In a statement given to the press before this conference it is explained that the council was asking the government to take the medical profession into its confidence. It is felt that in view of the fact that the operation of the Act is entirely dependent upon complete cooperation of the medical profession, very little consideration had been given the profession in formulating the Act. In fact, although the council felt that the door had been shut in its face, hope was expressed that an amicable understanding with the Provincial Secretary could be reached and means might be provided for keeping the council in closer touch with the proposed legislation.

The new hospital at Wells, erected late in 1935 by the Caribóo Gold Quartz Company, was officially opened by Dr. W. B. Burnett, president of the company, on January 15th. Dr. Burnett who has for long been a prominent practitioner in Vancouver was accompanied by Mrs. Burnett and Miss Burnett, and the medical profession was additionally represented by Dr. T. W. Sutherland, of Wells, and Dr. Darwin Oliver, of Quesnel.

Instructions to proceed with the organization of a Metropolitan Health Board have been given by the Vancouver Civic Health Committee to Dr. J. W. McIntosh, the present M. O. H. It is intended that some fifteen health boards of the Greater Vancouver area and suburbs and New Westminster be coordinated under one board. The Rockefeller Foundation has agreed to bear one-quarter of the cost, provided the government would also pay one-quarter, the remaining amount being borne by the various districts embraced in the Metropolitan scheme.

A new wing at the Cumberland General Hospital is planned, to cost approximately \$5,000, and tenders have been called for.

A meeting for the purpose of discussing the Health Insurance plans of the government was organized by a committee of Victoria citizens and held on January 30th. Eighteen delegates representing twelve Victoria organizations which had been invited to send representatives were present. Discussion turned on proposals already before the public in earlier drafts of proposed health insurance legislation, since Dr. H. M. Cassidy, the Provincial Director of Welfare, explained that the contents of the actual Bill to go before the Legislature could not be divulged. He stated however that ample time would ensue after its introduction in the House for public consideration of the revised plan. While it was not mentioned at this meeting, it is generally understood that the revised plan has eliminated the inclusion of indigents under provisions of the scheme which was a feature of the original draft bill.

In a leading editorial in the issue of February 1st, the *Victoria Daily Colonist* subjects the Government's

proposed Health Insurance scheme to sharp criticism. It states that the legislation "provides for supervision of the medical profession and presumably also for the setting of fees that may be charged to the Commission for treatment of persons insured under the Act. It can designate such specialists as may practise under the Act. It can designate the extent of the medical care to be provided by medical practitioners and the manner of its provision, which indicates that the Commission will be set up as a medical authority. It can even arrange for a review of the technical qualifications of medical practitioners and specialists who render services to insured persons."

A welcome note of humour has been introduced into the vexing question of Health Insurance by a well-known Vancouver chiropractor. Addressing a district residents' association in Vancouver on January 30th, this gentleman declared that the proposed British Columbia Health Insurance Bill was being pressed on the public at the instigation of the American Medical Association. He asserted that "the doctors here don't know what it is all about; the specialists here don't want it, and only 1 per cent of the population knows what the scheme is."

Dr. M. W. Thomas, of Victoria, has been appointed Executive Secretary of the College of Physicians and Surgeons of British Columbia, and will move to Vancouver at the beginning of February to assume his new duties.
D. E. H. CLEVELAND

Manitoba

The annual meeting of the Sanatorium Board of Manitoba was held on February 4th. The report of the Medical Superintendent, Dr. D. A. Stewart, who through illness was unfortunately unable to be present, showed that the past year had been one of progress. The sanatorium at Ninette opened in April a new operating room. Since then 64 thoracoplasties had been done on 31 patients, 24 phrenic nerve operations, and 31 operations for cutting pleural adhesions. The total number of operations was 151. Sanatorium beds were well filled throughout the year. Seventy-eight per cent of patients were classed having far advanced disease, and nearly all the others moderately advanced. Some form of collapse therapy was given or attempted in over 90 per cent. The average length of treatment was 340 days.

Studies made during the year included a second report on tuberculosis in nurses, studies of thoracoplasties, past and present; studies of children in Indian schools; of the sanatorium pneumothorax cases; of phrenic and pleural adhesion cases. The travelling clinics covered the province fairly fully in 47 clinics, with 5,004 examinations, of which over 40 per cent were in children and over 70 per cent in contacts.

The Central Tuberculosis Clinic in Winnipeg opened in the fall of 1930 has proved its usefulness. The failure of the 1935 crop to measure up to the high expectations entertained till the middle of July has reduced the income from the municipal levy, and strict economy will be necessary for the present year.

The post-graduate course in Gastricology arranged by the Faculty of Medicine, University of Manitoba, opened on February 4th with a registration of over 30, many doctors coming from a considerable distance. Dr. Walter C. Alvarez of the Mayo Clinic, Rochester, who was in Winnipeg taking part in the post-graduate

*Recommended by the
Medical profession*



for DISORDERS OF THE LIVER,
BLADDER AND KIDNEYS,
RHEUMATISM, ARTHRITIS



BOTTLED UNDER GOVERNMENT SUPERVISION AT THE SPRINGS

VICHY Célestins

Sales Agent: HERDT and CHARTON INC.
2027 McGill College Ave., Montreal 11 King Street W., Toronto

Classified Advertisements

ANÆSTHETISTS—Applications will be received from qualified medical graduates who desire training in anæsthesia with a view to specializing in that specialty. Montreal General Hospital, Montreal.

WANTED—Vacancy for women interns in general hospital for July 1st and September 1st, 1936. 100 beds, including surgical, medical, pædiatric and obstetrical services; venereal and mental clinics. Salary and maintenance. In the State of Pennsylvania. Also vacancy for one intern immediately. Apply Box 240, Canadian Medical Association Journal, 3640 University Street, Montreal.

NURSE WANTED—With laboratory and x-ray training for a small clinic. Write stating age, nursing qualifications and experience also salary expected. Box 241, Canadian Medical Association Journal, 3640 University Street, Montreal.

SALESMEN, to sell specialized Journals. Write A. W. Volland, The C. V. Mosby Company, 3525 Pine Blvd., St. Louis, Missouri.

STENOGRAPHER - SECRETARY, wants position in doctor's office or hospital. Five years' hospital experience. Can take charge of routine laboratory work and patients; also accounts. Best references. Reply to Box 242, Canadian Medical Association Journal, 3640 University Street, Montreal.

FOR SALE—Complete set of seven volumes, Nelson Loose-Leaf Medicine, with abstracts from 1923 to end of 1935, also five volumes Oxford Loose Leaf Surgery up to end of 1935. Apply estate of Dr. G. G. Little, 79 Wyandotte Street, Walkerville, Ontario.

PRACTICE FOR SALE—Large practice for sale of the late Dr. W. F. Park, Amherstburg, Ont., established 50 years, inclusive of home with offices, instruments, drugs, modern library and office furniture. Total price \$5,000.00. Apply H. H. Lester, Executor, Box 297, Amherstburg, Ont.

HOSPITAL FOR SALE—Fully equipped 10 bed hospital. Unusual opportunity for country doctor, in Northern Michigan. Practice established 32 years. Immediate cash sale. A bargain. Mrs. D. T. Smith, Omer, Michigan.

A Man Lives Too Long

He Dies Too Soon

if his old age must be spent in poverty and want.

if he has not made proper provision for the continued comfort of his family.

Life Assurance affords protection against each of these possibilities.

By means of one of the easy SUN LIFE plans, a man can be assured of an income for his own later years if he lives, or for his family's needs if he dies.

*Your nearest SUN LIFE representative will be
pleased to draw up a plan to suit your own
particular requirements on request.*

SUN LIFE ASSURANCE COMPANY OF CANADA
Head Office :-: Montreal

course, addressed a meeting of the profession of Winnipeg on "The physiology of the gastro-intestinal tract" on February 5th, and also spoke at the clinical luncheon held at the Winnipeg General Hospital on February 6th.

Dr. O. G. Hague, late Radiologist to the St. Boniface Hospital, has entered suit against the corporation of the Hospital for a sum of over \$3,000.00. It is alleged that the contract was on a yearly basis and that at the time of his dismissal he was given only one month's salary.

ROSS MITCHELL

New Brunswick

Dr. J. R. Nugent, of Saint John, has been elected President of the Saint Patrick Society.

Drs. E. C. Menzies, W. O. McDonald and George White have recently returned from post-graduate courses in Boston.

The Department of Health of New Brunswick has recently made possible the visit of Dr. R. A. H. Mackeen, Provincial Pathologist, to Kingston, Ont., where Dr. Mackeen prosecuted a close study of the cases treated there by the new Ensol treatment.

A. S. KIRKLAND

Nova Scotia

As several cases of diphtheria appeared at intervals in the New Waterford District inoculation of school children against diphtheria was undertaken in that area and in all 250 children were treated. This work was carried out under the supervision of Dr. Morrison, aided by local physicians.

A meeting between representatives of the Halifax Medical Society and the City of Halifax Board of Health was held, to discuss the memorial presented by the local Society in 1934. It was pointed out that some of their recommendations had already been carried out. Of the 18 recommendations originally made the following were of special interest: that the law concerning vaccination against smallpox be strictly enforced; that immunization against diphtheria and hospitalization of diphtheria and scarlet fever cases is desirable. It was pointed out that a certain milk supply had a bacterial count above the safety margin and that numerous cases of measles were not reported.

Appointment of a Committee at Pictou to consider the erection of a home to isolate cases of tuberculosis considered incurable was made by the municipal council. The Medical Officer of Health has been instructed to make a survey to ascertain the number of cases.

In the Supreme Court Mr. Justice Doull dismissed with costs the appeal of A. W. Penchard, of Yarmouth, previously convicted under the Optometry Act. The accused was charged with soliciting and canvassing from house to house contrary to the provisions of the Act.

N. B. DREYER

Ontario

The will of the late Mrs. Albert Sykes has been filed for probate at Whitby. After money provision for a number of bequests, the residue of the estate is to be paid to the Oshawa General Hospital for the erection of a children's wing. It is estimated that the residue may amount to \$100,000.

On January 3rd, an event of unusual interest took place in the form of a complimentary dinner given by the Board of Trustees of the Oshawa General Hospital,

to the Medical Superintendent, Dr. David S. Hoig, a graduate of the Toronto School of Medicine, 1880.

The dinner marked the twenty-fifth anniversary of his occupancy of that position, as well as the completion of fifty-five years of service as a general practitioner in this community. The dinner was attended by about seventy-five members of the Hospital Board with their wives, the medical staff and their wives, and the Lady Superintendent of the Hospital. The occasion was also graced by the presence of His Honour, the Lieutenant-Governor of Ontario, Dr. Herbert A. Bruce, and Mrs. Bruce.

The budget of the Ontario Division of the Canadian Red Cross Society for 1936 includes an item of \$255,000 for outpost hospital services in the isolated districts of northern Ontario. This is the result of the consideration of imperative appeals for this service from a number of districts which are separated by many miles from other hospitals.

Dr. W. H. Brydon, of Brampton, has been named coroner for the Brampton District as successor to the late Dr. J. A. Lawson.

During the last week of January, the Women's College Hospital at the head of Elizabeth Street, near Queen's Park, was opened. The ceremony was very quiet because of the mourning for our late King. The new hospital is a ten-storey structure containing every convenience and the most modern equipment. The first unit is to accommodate about 140 beds with a possible bed capacity of 350 in the future.

On January 24th, the new private patients' wing of the Toronto Western Hospital was formally opened. This wing is fourteen storeys high and contains 190 rooms. It is on the site of the Western Hospital on Bathurst Street. This additional space at the Western Hospital will result in the closing of Grace Hospital which, for some years, has been merged with Western. The new hospital now has 150 private and semi-private beds, 75 semi-public beds, and 290 public ward beds, making approximately 500 in all.

J. H. ELLIOTT

Quebec

The latest issue of the *Health Bulletin of the Department of Health, Montreal*, presents an interesting report on a recent outbreak of trichinosis in that city. The report is preceded by a brief description of the disease written by Dr. J. C. Meakins. The report was prepared by Dr. J. H. Gervais, Superintendent of the Division of Contagious Diseases.

In January, 1935, a fatal case occurring in a child eight years of age, diagnosed at autopsy, was reported. Five other members of the family showed symptoms similar to the fatal case. This family frequently used pork products purchased from a number of different distributors. In December, a special meat supply was bought at a public market from a farmer residing in the vicinity of Montreal; this included sausages, blood pudding and pork. Four days later, two members of the family experienced gastro-intestinal disorders; four others had symptoms eight and nine days later. Two members of the family did not eat sausage. Investigation in the country among the usual sources of meat used by this family, and particularly the farmer referred to, failed to reveal evidence of trichinosis in animals or human beings. The village doctor reported no suspicious symptoms among his patients. No local piggery was known to be infested by rats.

During the latter part of October and early in November, 1935, new cases were reported. Investigation of the reported cases revealed many other cases. A total of 68 cases in 35 families (1 family with 5 cases, 4

Biological Products from the Adrenal Glands

Adrenal Cortical Extract

In the course of extensive research in the Connaught Laboratories on the preparation and properties of Adrenal Cortical Extract, sufficient quantities of this material have been obtained to enable the Laboratories to offer this extract to physicians. Adrenal Cortical Extract contains the active principle of the adrenal cortex and it has proved useful in the treatment of certain cases of Addison's disease. The extract is non-toxic, is free from pressor or depressor substances and is biologically standardized. It is distributed as a sterile solution in bottles containing twenty-five cubic centimetres.

Ephinephrine

During the preparation of Adrenal Cortical Extract, Epinephrine is obtained as a separate product. This is the active principle of the adrenal medulla and has, of course, been used for many years to stimulate heart action; to raise the blood-pressure; to relieve attacks of bronchial asthma, etc.

Two strengths of epinephrine solution are available from the Connaught Laboratories:

Epinephrine Hydrochloride 1:1000

Physicians are well acquainted with this concentration of epinephrine. It is a sterile solution provided in bottles, each containing thirty cubic centimetres. The bottles are fitted with a special rubber cap, making possible the withdrawal from time to time of desired amounts without contaminating the rest of the solution.

Epinephrine Hydrochloride Inhalant Solution (Epinephrine Concentration 1:100)

Recently considerable success has been secured in the alleviation of attacks of bronchial asthma by spraying into the nose or mouth this more concentrated solution of epinephrine. Since only small quantities of this solution are employed it is distributed in bottles containing five cubic centimetres. Each bottle is provided with a dropper fastened into the stopper so that small amounts of the solution may be transferred to the special atomizer used in this type of treatment.

Prices and information relating to the use of these products from the Adrenal Glands will be supplied gladly upon request.

CONNAUGHT LABORATORIES

University of Toronto

TORONTO 5

CANADA

families with 4 cases, 4 families with 3 cases, and 9 families with 2 cases) were discovered. A common source of meat supply was found—a butcher of foreign nationality who had a trade in pork products prepared in the various ways used chiefly by his countrymen. He had a retail business and, in addition, supplied several small food establishments and a popular dining-club, most of the patrons of which were his compatriots.

A number of samples of pork and prepared meat products were negative to both macroscopic and microscopic examinations. The butcher had purchased his supplies of pork from various sources. An investigation of the sources failed to reveal anything. Doctor Gervais arrives at the following conclusions:

"1. That the contamination of those persons by infected meat was of a short duration, because after the 10th of November, no other case was detected.

"2. That the infected pigs were coming from supplies bought around October 15th, and that those pigs must have been used in a very small amount in the making of sausages, because among the numerous customers of the suppliers 68 persons only suffered from trichinosis.

"3. That the relapse of trichinosis cases in Montreal, in October and November, had no connection whatsoever with cases that broke out in January, 1935, because the pigs had not been purchased from the same place."

Dr. H. S. Birkett, of Montreal, has just been notified by the Secretary of State for Foreign Affairs that he has been appointed official representative for Canada at the International Congress of Otology and Laryngology which meets at Berlin in August of this year.

Dr. Karl M. Wilson, Professor of Obstetrics and Gynecology at the University of Rochester, delivered an address on "Maternal mortality" before the Montreal Medico-Chirurgical Society on January 17, 1936. It was discussed by Dr. R. E. Wodehouse, Deputy Minister of Pensions and National Health, Ottawa, Dr. W. W. Chipman, Dr. S. Boucher, M.O.H., Montreal, and Dr. Stephen Langevin, of the University of Montreal. Professor Wilson's address will be published in this *Journal* shortly.

Dr. Francis R. Packard, Editor of the *Annals of Medical History*, of Philadelphia, was a recent visitor to Montreal. While in that city he addressed the AOA Society on February 7th, on "The two Hunters". This address, while referring to the scientific work of these two distinguished brothers, also gave an excellent picture of the medical and social atmosphere in which they worked. The lecturer pointed out the important fact that John Hunter introduced the teaching of anatomy, "after the fashion of Paris", in which dissections on the human body were employed. Before this time the subject had been taught in Britain from models, drawings and diagrams. The advance was notable. The reasons that the human body was not employed before in London for the purpose were, probably, that bodies were scarce, only four, those of executed criminals, being legally available yearly, and, further, no dissections were permitted outside of the building of the Guild of Barber-Surgeons. When the Barbers and Surgeons separated, at the time above referred to, this restriction was removed, and Hunter had a free rein. This freedom, however, led to the "bootlegging" of bodies for dissection and the rise of the "resurrection men".

On February 8th Doctor Packard was the guest of honour at the annual dinner of the McGill Osler Society. The chairman was Mr. R. Freeman and the speaker was introduced by Sir Andrew Macphail. Doctor Packard took as the text of his remarks an old case book of the Pennsylvania Hospital, Philadelphia, the oldest hospital in the United States. This book dated back to 1805. The hospital, of which Benjamin Franklin was the principal founder (in 1751), although modernized, contains

the building with the original wards of Franklin's time. The lecturer humorously remarked that in Philadelphia everything good is attributable to Benjamin Franklin and that they have not amounted to much since his time! The case book exhibited to the assembly proved of great interest, not only on account of the detailed reports of the various cases, which were excellently well done, and would do credit to a house surgeon even now, but were illustrated by coloured drawings of considerable artistic merit. The lecturer also took the opportunity to give biographical details about some of the outstanding figures in medicine and surgery of that date—Philip Syng Physick and Benjamin Rush, in particular. Doctor Packard commented on the fact that so many of the early Philadelphia medical men were graduates of Edinburgh and remarked that there was a sentimental affinity between the medical schools of the University of Pennsylvania and McGill, because the latter faculty also was founded by Edinburgh men. The lecture was of the highest interest and held the close attention of all present.

Saskatchewan

Osler night was observed by the Regina and District Medical Society on January 23rd. Dr. F. D. Munroe spoke of the loss sustained by the Empire on the death of the King. Two minutes silence was observed. Dr. F. A. Corbett gave an interesting address on "Osler the Man". Dr. W. A. Dakin spoke briefly of the loyalty and affection toward our new King, Edward VIII, felt by all his subjects.

Immediate enactment of health insurance, based upon the National Health Insurance Act of Great Britain, was urged upon the provincial government by the Saskatchewan executive of the Trades Congress of Canada.

After a certain date medical practitioners of Yorkton will refuse medical attention to any persons or family resident in Yorkton on relief unless and until the city council makes provision for such attendance. In a public declaration all the doctors practising in Yorkton gave notice to those who may need medical attention to bring the matter to the notice of the city as soon as possible.

LILLIAN A. CHASE

Book Reviews

The Parathyroids in Health and in Disease. David H. Shelling, B.Sc., M.D., Johns Hopkins University, Baltimore. 335 pages, illustrated. Price \$5.75. Mosby, St. Louis; McAlinsh & Co., Toronto, 1935.

This is a well-produced and scholarly review of the whole of the subject designated. There are chapters on tetany, on hyperparathyroidism, and on the use and abuse of parathyroid hormone preparations; while the fact that the author has himself made noteworthy contributions increases the value of the sections dealing with experimental research. The relation of the parathyroids to other endocrine glands and to vitamin D is discussed; and an appendix suggests various dietaries low in calcium or in phosphorus, with analyses. Each of the ten chapters is followed by a list of references so extensive that one is surprised to note that there are serious omissions. There appears, for instance, to be no mention of the work of Pugsley on calcium metabolism in the rat, of Bryan and Garrey on contributing factors in tetany, of Hastings and Huggins on experimental hypocalcemia and its compensation, of Waggenger on parathyroidectomy in the frog, or of Houssay on the dependence of the parathyroids on the pituitary and

For Digital or Mechanical Probes

PHYSICIANS find K-Y Lubricating Jelly an able ally in examinations that involve penetration of orifices with instruments or with fingers.

On gloves and instruments, K-Y is the ideal lubricant, for it is greaseless, will not irritate sensitive surfaces and gives soothing protection to mucous membranes.

While K-Y adheres instantly to gloves and instruments, it is readily soluble in water. It is also a valuable accessory in diathermy treatment.



» K-Y JELLY «

FOR EVERY PENETRATIVE PURPOSE

Johnson & Johnson Limited
MONTREAL CANADA

JOHNSON & JOHNSON LIMITED,
2155 Pius IX Blvd., Montreal, P.Q.

Please send me, without charge, a tube of K-Y Lubricating Jelly.

M.D.

Address..... Druggist's Name.....

pancreas. The important biological analysis of the various forms of serum calcium by McLean and Hastings is briefly dismissed. Names are rather frequently misspelled, and one gains the impression that the author is not wholly familiar at first-hand with the work of European investigators.

The Autonomic Nervous System: Anatomy, Physiology and Surgical Treatment. James C. White, M.D., Assistant Professor in Surgery, Harvard Medical School. 386 pages, illustrated. Price \$8.50. Macmillan, New York and Toronto, 1935.

This book consists of three parts. Part I presents the anatomy and physiology of the sympathetic and parasympathetic nervous systems. In addition to the embryological development and general anatomy and physiology of these systems the chemical mediation theory of nervous activities and of visceral pain is discussed. Part II considers the sympathetic nerves in pathological conditions: peripheral vascular disease, pain in the extremities, diseases of the heart and of the aorta, hypertension, diseases of the lung, of the gastro-intestinal tract, of the urogenital tract, and of the bones and joints. Part III describes the technique of sympathectomies.

The style in which the book is written is clear and pleasing. For anyone who wishes to inform himself of the present-day conception of the autonomic nervous system Dr. White's book contains a brief but comprehensive description. For those who wish to go more deeply into the subject there is an extensive bibliography at the end of each chapter. Anatomy and physiology, however, are included only in order to lay the foundation for a presentation of the newly developed surgical attitude toward the vegetative nervous system. The interest and purpose of the author are clinical. The nature of the involvement of the sympathetic and parasympathetic systems in a number of pathological conditions, some forty altogether, is described and the rationale of the surgical procedure indicated in each case is discussed.

Diseases treated by sympathectomy include Raynaud's disease, thromboangiitis obliterans, causalgia, epilepsy, migraine, angina pectoris, essential and malignant hypertension, pain from aortic aneurysm and pain from abdominal and pelvic viscera. This list is not complete but it indicates the scope of this newer field in neurosurgery. Numerous protocols of cases are introduced, together with tables which summarize results of the author's experience. The chief benefit appears to be relief from pain. The physiologist may question the implication that removal of sympathetic ganglia will not produce any serious effect. At times Dr. White may appear to be a trifle more enthusiastic than cold consideration of the facts warrants, but on the whole his presentation seems fair. As an exposition of the arrangement and function of the autonomic nervous system, its relation to various pathological states, and the operative procedures upon it this book is to be commended.

Fundamentals of Biochemistry (in Relation to Human Physiology). T. R. Parsons, B.Sc., M.A., Sidney Sussex College, Cambridge. Fifth edition, xii and 453 pages. Price 10s. 6d. Heffer, Cambridge, England, 1935.

The first edition of this little book appeared in 1923. The steady appearance of new editions is sufficient evidence of its popularity and usefulness. The general arrangement of the original has been maintained, although the various sections have been brought up to date to include newly discovered material pertinent to them. In this edition a new section deals with the chemistry of muscle metabolism.

The author makes no pretence to cover the whole of biochemistry, but deals thoroughly in a very readable and

often almost a racy fashion with those subjects which he considers to be fundamental. The book is written as an adjunct to physiology and stresses organic chemistry throughout. Physical chemical matters are brought in from time to time, and the bearing of physical chemistry on biochemistry is considered in some detail in the final chapters. It is perhaps significant that enzymes are not dealt with until page 252, although biochemistry is very largely the story of enzyme actions and their results. Mineral metabolism is practically untouched.

The book deals in leisurely and charming fashion with some of the most important aspects of biochemistry, and thus affords an excellent introduction to the science, but only an introduction. By itself it is insufficient for the needs of the modern student of medicine, if he is to receive a biochemical training adequate for full appreciation of the modern science of medicine.

High Blood Pressure and its Common Sequelæ. Hugh O. Gunewardene, M.B., B.S., D.N.R.E., Clinical Assistant, National Hospital for Diseases of Heart, London. 172 pages. Price \$2.25. Baillière, Tindall & Cox, London; Macmillan, Toronto, 1935.

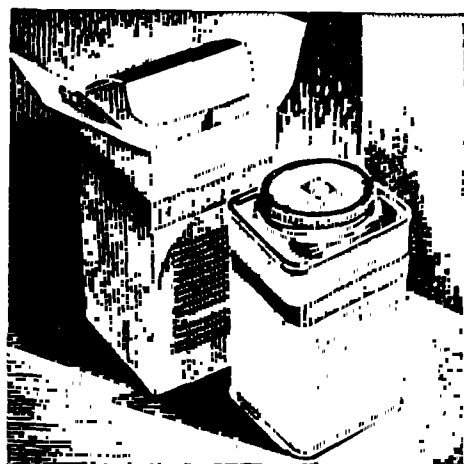
The aim of the book is to encourage the study of high blood pressure by the general practitioner. It is pointed out that too little attention is paid to the manifestations of the early stages of high blood pressure, such as sensory disturbances. Also, emphasis is laid on the fact that essential hypertension is often curable if treated early. The book is clearly written and contains much clinical detail from the author's experience.

Diseases of Women. H. S. Crossen, M.D., F.A.C.S., and R. J. Crossen, M.D., Instructor in Clinical Gynecology and Obstetrics, Washington University School of Medicine. Eighth edition, 999 pages, illustrated. Price \$12.00. C. V. Mosby, St. Louis; MacAinsh, Toronto, 1935.

So important is the recent work on the relation of endocrine glands to the genital tract that any text-book of gynecology published within the last two years must present this new knowledge to its readers as clearly and concisely as lies within the power of the author. The authors of this eighth edition of a well-known text-book are skilful teachers and their book shows their ability not only to set forth the facts intelligibly but to elucidate them. Under their pens even such a vexed problem as the classification of ovarian neoplasms becomes relatively simple. The needs of the student are always kept in mind and the illustrations really illustrate. The gas test for tube patency, the x-ray examination of uterus and tubes with lipiodol treatment, of trichomonas vaginitis, office cauterization and conization of the cervix are clearly described. Chapters on medico-legal points in gynecology and the lower intestinal tract in relation to gynecology are included. Altogether this book can be heartily recommended.

Diseases of the Skin. F. C. Knowles, M.D., Professor of Dermatology, Jefferson Medical College. Third edition, 640 pages, illustrated. Price \$6.50. Lea & Febiger, Phila., 1935.

The present edition contains some 50 pages more than the previous one and much of the matter is new. There are numerous new photographs of improved quality, while on the subject of the new diseases which have been added the reader will find much to interest him. The attempt to include all known diseases of the skin makes it a little confusing for the general practitioner, but he will find much to help him in differential diagnosis and in treatment. One might offer the suggestion, in view of recent knowledge, that all cases of erythema nodosum call for an x-ray study of the chest, and that the omission of any reference to the tannic acid treatment of burns is a serious one.



Gastric Hyperacidity

In the relief of gastric hyperacidity, *speed* is essential—Cal-Bis-Ma provides it. The neutralizing effect should be *prolonged* so as to prevent secondary acid rise—again Cal-Bis-Ma takes care of that. The irritated gastric mucosa should be soothed and protected from further irritation—that, too, is an important mission of Cal-Bis-Ma. Send for a trial supply and descriptive literature.

CAL-BIS-MA

WILLIAM R. WARNER & CO., LTD.
727 KING STREET, WEST • TORONTO, ONTARIO

Cal-Bis-Ma (powder) is supplied in tins (with removable label)
containing $1\frac{3}{4}$ and 4 ounces.

★ CYSTITIS

Prompt symptomatic relief

Prompt relief of the distressing symptoms which often accompany cystitis may be obtained by the oral administration of Pyridium. Shortening of the duration of treatment has been reported in many cases. Pyridium is non-toxic and non-irritative in therapeutic doses. The use of Pyridium Solution for irrigation or topical application may be effectively combined with the oral administration of the tablets.



TRADE **PYRIDIUM** MARK

Phenylazo - Alpha - Alpha - Diamino - Pyridine Mono - Hydrochloride

for more than 4 years—

Pernicious Anemia has been adequately and economically treated with

PARENTERAL LIVER EXTRACTS

Lederle

Potent, Clinically Tested Extracts provide for:

- Intensive therapy during the period of relapse with a minimum of inconvenience (*i.e.*, reduced volume and a small number of injections) to the patient.
- Rapid hematopoietic response and general improvement of all symptoms.
- The intensive treatment of cases with marked neurological changes, those having complications and those advanced in years—all of which require more than normal amounts of the antianemic substance.

Authorities on the treatment of pernicious anemia are agreed that the injection of liver extract derived from a certain amount of fresh liver gives an effect equivalent to 30 to 60 times that amount administered orally.

LEDERLE'S latest contribution to the effective and economical treatment of Pernicious Anemia is

1 CC. CONCENTRATED SOLUTION LIVER EXTRACT *Lederle*



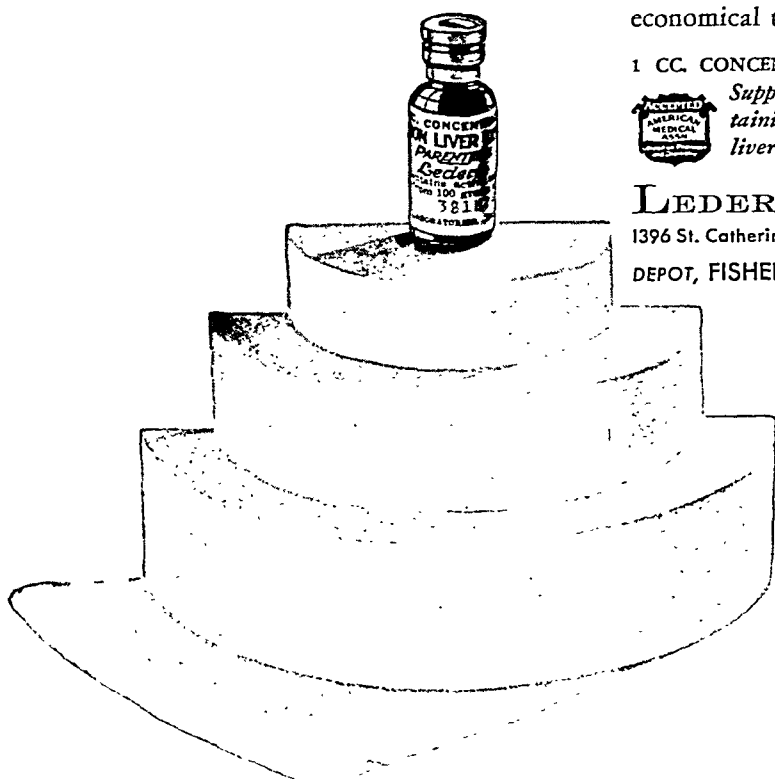
Supplied only in boxes of three 1 cc. vials — each vial containing antianemic substance obtained from 100 grams of liver.

LEDERLE LABORATORIES, INC.

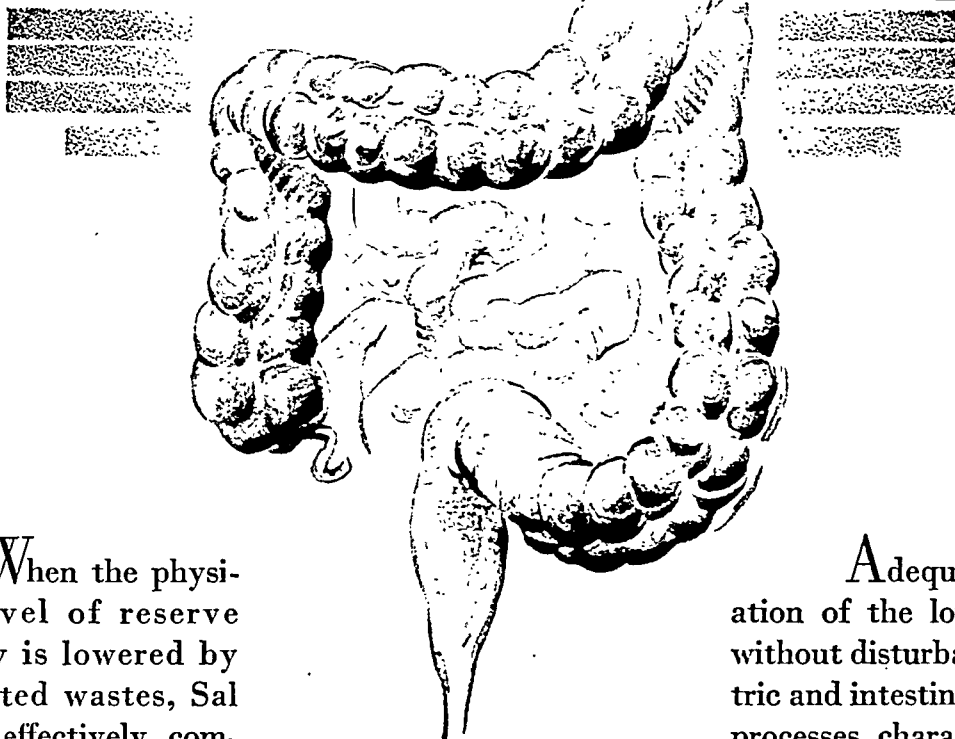
1396 St. Catherine Street, West

Montreal, Quebec

DEPOT, FISHER & BURPE, 219 Kennedy Street, Winnipeg, Manitoba



Maintain THE ALKALINE LEVEL



When the physiologic level of reserve alkalinity is lowered by accumulated wastes, Sal Hepatica effectively combats the "relative" acidity, eliminates the wastes and restores the alkaline reserve toward the normal level.

Adequate evacuation of the lower bowel, without disturbance of gastric and intestinal digestive processes, characterizes the aperient action of Sal Hepatica—the scientifically prepared counterpart of famous mineral waters.

Sal Hepatica is pleasantly effervescent, and its two-fold action produces a distinctive feeling of well-being. May we send a generous clinical supply?

SAL HEPATICA CLEANS THE INTESTINAL TRACT AND COMBATS ACIDITY

COUPON

BRISTOL-MYERS COMPANY
1241-C Benoit St., Montreal, Canada.

Please send clinical supply and literature
on SAL HEPATICA.

..... M. D.

St. and No.

City Prov.

BRISTOL-MYERS COMPANY, NEW YORK, N. Y.



60.4

28.2

est shows ~***KNOX GELATINE****Greatly Reduces Curd Tension
of Milk**

A coagulent was added to Grade A milk.
The curd tension was 60.4.

One percent of Knox Gelatine (plain)
was added to the same grade of milk.
The reading was 28.2, or a curd tension
reduction of more than 50%.

Knox Gelatine is an exceptionally pure
product. It is of the same neutrality as
certified milk and, like milk, has colloidal
properties. In difficult infant feeding
cases, one envelope ($\frac{1}{4}$ of a package)
may be mixed with the day's supply of
food.

† As reported before the American Chemical
Society, June, 1935.

KNOX**SPARKLING
GELATINE**

KNOX GELATINE LABORATORIES
453 Knox Avenue, Johnstown, N. Y.

Please send me clinical literature.

Name.....

Address.....

City.....State.....

DOUCHING *that* RELIEVES

A douche preparation is not alone measured by its efficacy as a detergent. To be effective it must relieve the condition for which it is prescribed. And in its action it must be mild and non-caustic in contact with vaginal mucosa. The formula of Lorate... sodium perborate, sodium bicarbonate, sodium chloride, menthol and aromatics... not only is absolutely bland and soothing, but in addition it appreciably reduces irritation and inflammation and relieves the inevitable discomfort from these causes. Lorate is supplied in 8 oz. containers. The usual dosage for Lorate is 2 teaspoonfuls to every quart of water. A professional supply of Lorate and descriptive literature will gladly be sent free on request.

INDICATIONS

As a deodorant after menstruation. During the menopause. After childbirth. In leucorrhea. In cervicitis. In trichomonas vaginalis. After gynecological operations. For the cleansing douche.

LORATE

..... the Therapeutic
Vaginal Douche Powder

WATERBURY CHEMICAL CO. OF CANADA, LTD. • 727 KING STREET, W. • TORONTO, ONT.

To enable your
patients to obtain
LACTOGEN
at a *lower*
price



the
price of
the 1-lb. size
can of LACTOGEN
has been reduced
to our wholesale
trade by
16⅔%

NESTLÉ'S MILK PRODUCTS
(CANADA) LTD.
Metropolitan Building
TORONTO - CANADA

You can Recommend Them with Confidence

Carbohydrates in their most easily digested form—"Crown Brand" and "Lily White" Corn Syrups used in conjunction with cow's milk provide the most efficient and economical bottle feed for infants. Their low cost with equal quality in comparison with the more expensive prepared carbohydrates make them by far the most economical infant food you can use or recommend.

Many leading physicians have for years specified these two famous brands with confidence and knowledge of the hygienic conditions under which they are manufactured.



EDWARDSBURG
CROWN BRAND CORN SYRUP
and **LILY WHITE CORN SYRUP**

Manufactured by THE CANADA STARCH COMPANY Limited

FOR THE MEDICAL PROFESSION

A convenient pocket calculator, with varied infant feeding formulae employing these two famous corn syrups, and a scientific treatise in book form for infant feeding, also prescription pads, are available on request. Kindly clip the coupon below and this useful material will be mailed to you immediately.

THE CANADA STARCH CO. Limited
Montreal

Please send me

- ☐ FEEDING CALCULATOR.
☐ Book "CORN SYRUPS FOR INFANT FEEDING".
☐ PRESCRIPTION PADS.

Name

Address

.....

.....

CORAMINE "CIBA"

Circulatory and Respiratory Stimulant

Coramine is a 25% solution of pyridine-b-carboxydiethylamide.

By a direct influence on the centre, it acts as a most efficient respiratory stimulant; increasing both the depth and the rate of respiration.

Coramine stimulates the heart, leading to an increase in the output of blood; at the same time, it tends to cause vascular relaxation, so that, with or without a rise in the blood-pressure, the rate and efficiency of the circulation are improved.

AMPOULES

-

LIQUID

CIBA
COMPANY
Limited
MONTREAL

Throat Infections

In conjunction with your more specific measures, we suggest a frequent gargle of equal parts LAVORIS and hot water.

You can depend upon LAVORIS for a freer removal of viscid accumulations and a maximum reduction of organisms. In addition it has a decidedly beneficial and comforting effect upon inflamed tonsils and membranes.

Sample
on
request

LAVORIS

Made In Canada by

LAVORIS CHEMICAL COMPANY LIMITED
92 Jarvis Street, Toronto, Ontario

DR COLLECTEM

"Look at this
Weekly Report
from The
Medical Audit
Association"

—says Dr. Brown!



"Along with it came their cheque, covering collections from past-due accounts which I otherwise would have written off eventually as hopeless. I just send them a fresh list, each month. And they keep right on sending me the money! No Collection — No Charge."

We'll gladly do the same for you, too, Doctor!

Mail us your list To-Day!

THE MEDICAL AUDIT ASSOCIATION

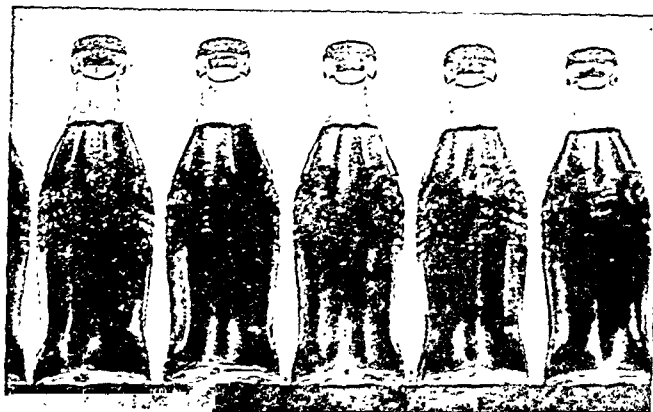
44 VICTORIA STREET, TORONTO

precise **ACCURACY**
with **Portability**
and these exclusive features:

**KOMPAK
MODEL**
SMALLEST
LIGHTEST
HANDIEST

Lifetime
Sphygmomanometer
STANDARD FOR BLOODPRESSURE

W. A. BAUM CO. INC. NEW YORK
SINCE 1916 **ORIGINATORS AND MAKERS OF
BLOODPRESSURE APPARATUS EXCLUSIVELY**



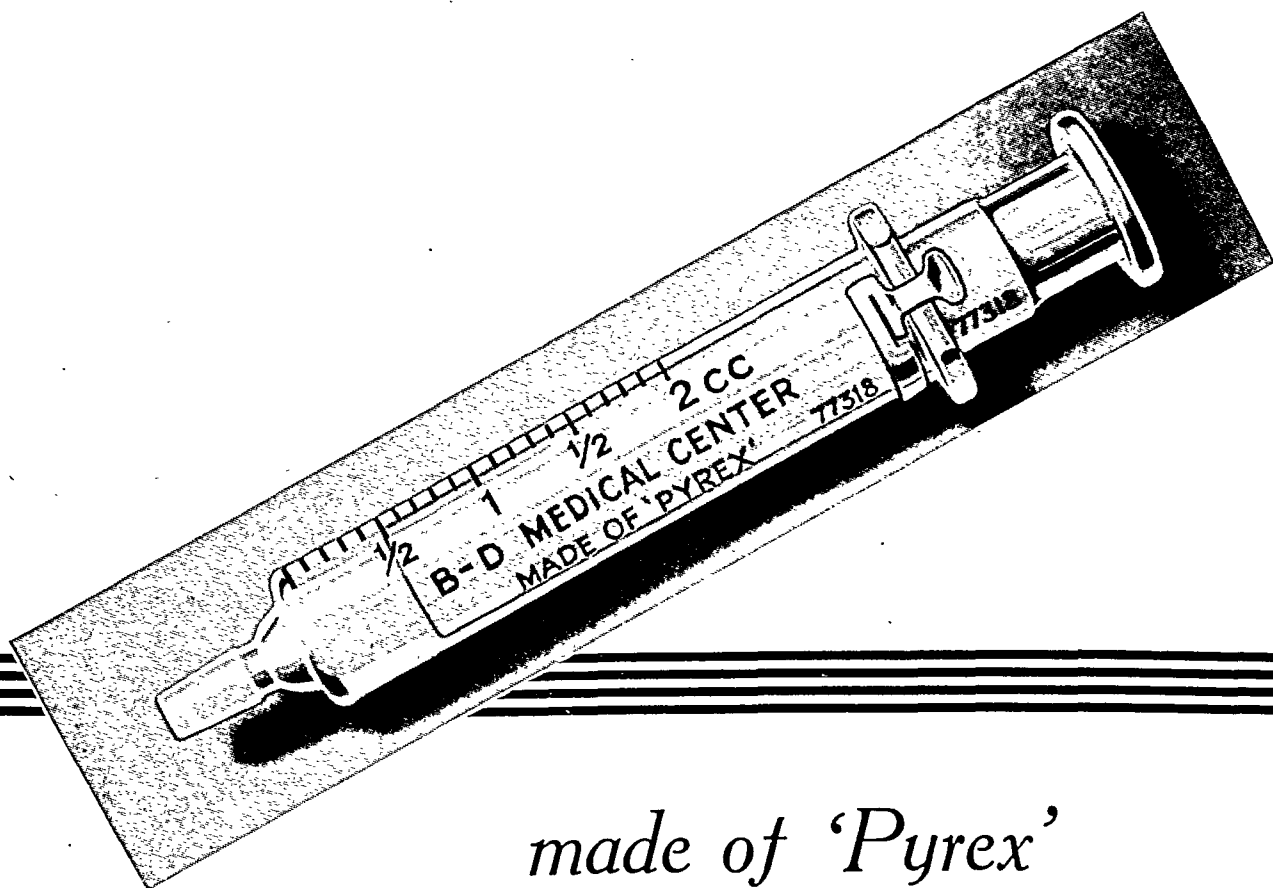
"Coca-Cola" is made in
modern, sanitary plants
... science safeguards its purity

"Coca-Cola" is a pure drink of natural flavors. Scientific equipment subjects the water used in making "Coca-Cola" to an absolute purification—healthful carbonation keeps it pure. Automatic machinery sterilizes, fills and seals every bottle air-tight, without the touch of human hands.

"Coca-Cola" is sold in 76 countries and complies with the pure food laws of all of them.

The Coca-Cola Company of Canada, Limited

Coca-Cola



made of 'Pyrex'

B-D MEDICAL CENTER SYRINGE

A smoothly working, accurate syringe of typical B-D design that will withstand more than 150 hours of continuous sterilization . . . Immune to thermal changes. Designed for strength at tip and barrel base where most breakage occurs.

Made in all popular sizes with both center and eccentric tips.

FEATURES

1. Uniform, strong tip. No weakening score encircles the tip.
2. Reinforced lower barrel end. Smooth inside . . . no score rings.
3. Flared barrel opening. Receives plunger easily. Less breakage.
4. Precision line on plunger. Aligns with scale marks. Accurate dosage.
5. Individually numbered plunger and barrel. Facilitates assembly.
6. Slightly concave plunger thumb rest. Provides surer touch.
7. Simple, non-scraping plunger clip retains plunger. Convenient.
8. Barrel and plunger individually fitted.
9. Dated certificate of accuracy with each syringe.
10. Careful annealing eliminates strains. Stands more than 150 hours of continuous sterilization.

Certain B-D Products

Now Duty Free

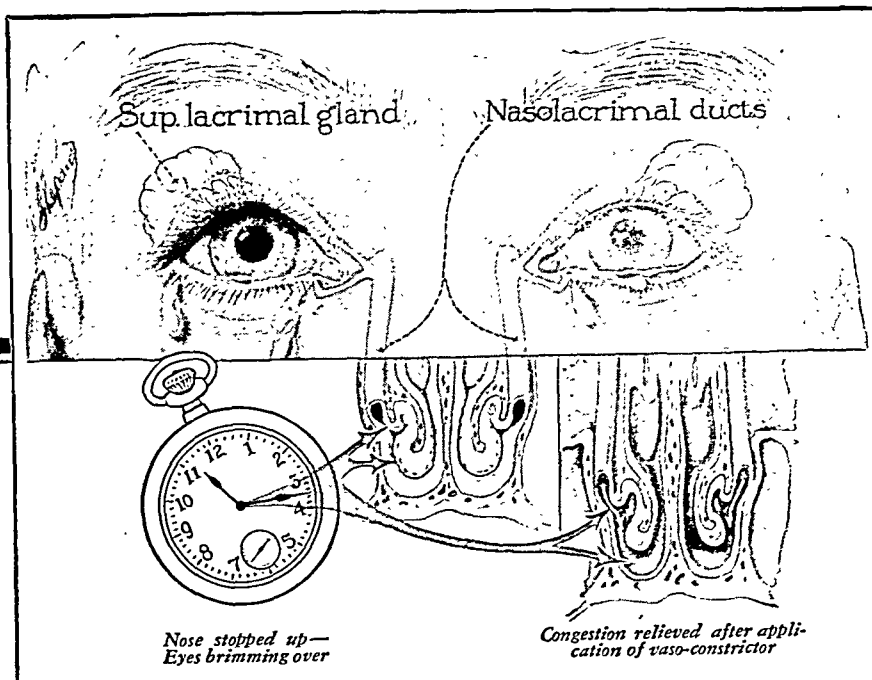
B-D surgical syringes, surgical needles and clinical thermometers are DUTY FREE under the Canada-United States Trade Agreement. These products are also exempt from Sales Tax. Special Excise Tax of 3% applies.

B-D PRODUCTS

Made for the Profession

BECTON, DICKINSON & Co., RUTHERFORD, N.J.

DECONGESTIVE - SOOTHING



NEO-SYNEPHRIN HYDROCHLORIDE

(levo-meta-methylaminoethanolphenol hydrochloride)

In relieving the symptom of nasal congestion, the valuable vaso-constrictor, Neo-Synephrin Hydrochloride, offers these advantages:

- Active on repeated application
- More sustained action than epinephrine
- Less toxic in therapeutic doses than epinephrine or ephedrine
- No sting at point of application

The absence of irritation and sting, low toxicity, little nervousness or palpitation, combined with prompt and prolonged effect are some of the reasons for the clinical success of Neo-Synephrin.

Supplied in these convenient dosage forms:



SOLUTION
1/4% and 1%
ONE-OUNCE BOTTLES

EMULSION
1/4%
ONE-OUNCE BOTTLES

JELLY
1/2% IN COLLAPSIBLE TUBES
with nasal applicator

Sample and literature on request

FREDERICK STEARNS & COMPANY OF CANADA, LIMITED
WINDSOR, ONTARIO

Detroit, Mich.

San Francisco, Calif.

New York, N. Y.

Kansas City, Mo.

Sydney, Australia

Libby's Homogenized Foods prescribed as early as 3 months

● Clinical feeding tests show that many babies can be fed Libby's homogenized vegetables as early as three months, and that these foods are very well tolerated. Infants had improved colour and muscles of a firmer tone.

The discovery of a special method of homogenizing vegetables, fruits, cereal and soup, perfected by Libby, is now recognized as a valuable contribution to infant feeding.

Libby's homogenization process breaks up cellulose structures around food cells and reduces coarse fibres in solid foods to tiny particles. The foods can be more easily and completely digested by infants than strained foods. The prescription of a diet containing vitamins, minerals and other food essentials not found in milk is thus made possible at a much earlier age.

Libby's Homogenized Foods comprise a complete food diet in six tins containing combinations that give an ideal blend of essential food elements. They include three vegetables, cereal, fruit and soup, for variety and balance in the diet.

Pediatricians are invited to write Libby, McNeill & Libby Laboratories, Chatham, Ontario, for a series of bulletins which summarize the research on infant feeding that Libby has conducted. Also for samples of Libby's complete line of Homogenized Foods.

LIBBY, MCNEILL & LIBBY OF CANADA, LIMITED
Chatham - - - - - Ontario



Photograph Copyright, Star Newspaper Service.



Libby's
Made in Canada

**Homogenized
FOODS FOR BABIES**

UNSEASONED EXCEPT FOR SALT • PACKED IN ENAMEL-LINED TINS

Hastens Convalescence

Reconstructive ---
Strength-Building

NEOBOVININE

WITH MALT AND IRON

Note These Advantages:

LIVER EXTRACT—The anti-anemic factor.

IRON—In assimilable form (464 mgm. per 100 cc.)

MALT EXTRACT—High nutritive value.

VITAMINS B AND G—In liberal supply to aid appetite, digestion.



SUPPLIED IN
BOTTLES OF
8 FLUID OUNCES

NEOBOVININE
364 Argyle Road
Walkerville, Ont.

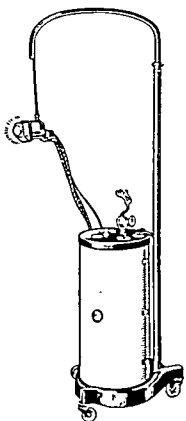
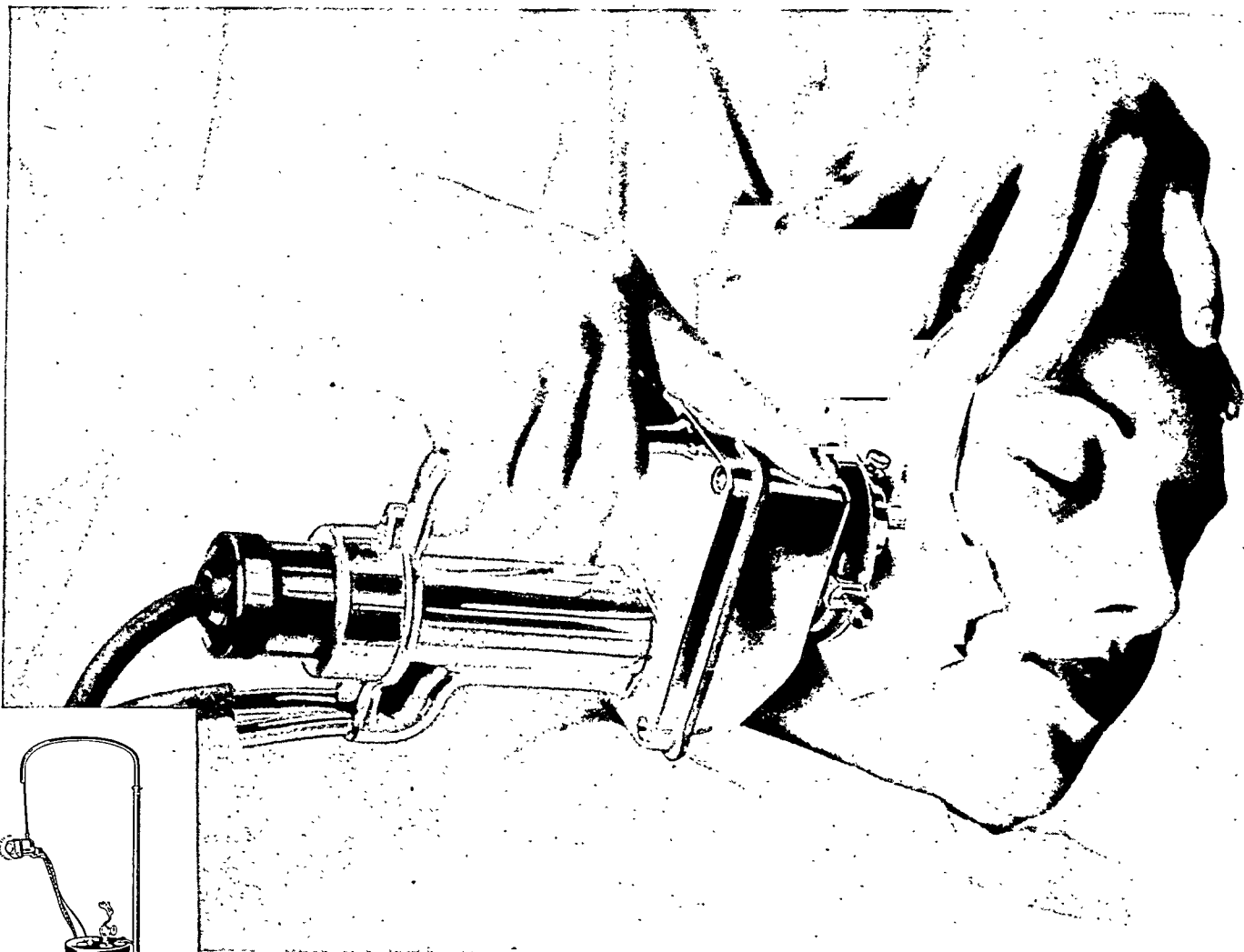
Dept. C.A. 3

Send me FREE for clinical trial, Neobovinine
with Malt and Iron.

Dr.

Address

City. Prov.



SUPER SELF-CONTAINED KROMAYER LAMP (Water-Cooled)

This lamp is widely used in Hospitals and in physicians' offices where the patient requires local ultraviolet therapy on the skin surfaces or within the cavities of the body. The unit provides a powerful, convenient and economical means of obtaining, upon brief exposures, any required degree of clinical actinic reaction. Every practitioner of ultraviolet therapy will find the super self-contained

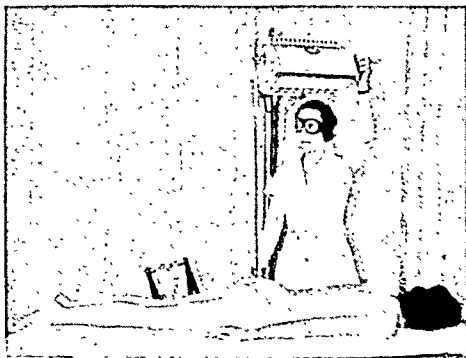
Kromayer a definite aid to localized treatment.

SUPER ALPINE SUN LAMP

A highly perfected quartz-mercury ultraviolet generator assuring accurate and controlled irradiation intensity for every therapeutic need.

Ask for demonstration by your local Medical Supply House.

Inquiries will receive prompt and careful attention. Booklets illustrating Hanovia equipment in detail will be sent upon request.



Accepted by The American Medical Association Council on Physical Therapy.

HANOVIA Chemical and Manufacturing Co.
Dept. 252-C - NEWARK, N.J.



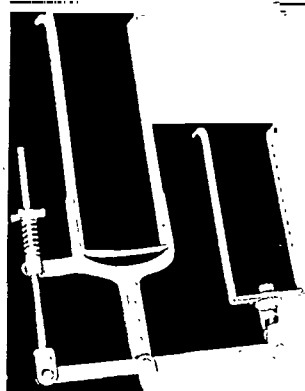
When Acidosis Complicates Disease

Supporting the alkali reserve has become a routine measure in diseases characterized by acidosis. For this purpose, Alka-Zane is extensively used because it supplies the four bases of which the reserve is essentially composed: sodium, potassium, calcium, magnesium. These are made available to the organism in the form of carbonates, citrates and phosphates. Alka-Zane contains no tartrates, lactates, or sulphates, and no sodium chloride. It is a convenient and efficient way to prescribe alkalizing medication that is palatable and easy to take.

Alka-Zane is supplied in 4 ounce bottles. Trial supply sent on request.

ALKA-ZANE

WILLIAM R. WARNER & CO., Ltd., 727 King Street, West, Toronto, Ontario



Roger Anderson Well-Leg Splint

Wheel-chair Method of Treating Fractures of the Hip, Shaft of Femur and Pelvis

(See Page 625 June issue)

\$38.50

F.O.B. Seattle

THE TOWER COMPANY, Inc.

1121 Post Street - SEATTLE, WASHINGTON

Also manufacturer Ought-O-Matic Frax-Sure Splints for the treatment of the majority of upper and lower extremity fractures.

BEE VENOM
from
LIVING BEES



In the Treatment of Rheumatism

While bee venom therapy has already proved its efficiency in the treatment of rheumatism, Forapin, the new active bee venom salve represents a considerable advance in its technique. Clinically tested with success in cases of Myalgia, Neuralgia, Arthritis and Sciatica. Inexpensive and easily applied.

A complimentary tube with literature sent to physicians on request to

W. LLOYD WOOD LTD

64-66 Gerrard St. E., TORONTO

FORAPIN

Supplied in collapsible tubes

No. 1 Normal - \$1.65 each

No. 2 Strong - \$1.90 each

Dr. H. LABBE, Professor of the Faculty of Medicine of Paris and E. DONARD'S

(I. G. B.)

DIABETOSAN

PREPARED IN THE SOUDAN LABORATORIES OF PARIS

4 DIFFERENT TREATMENTS

LIGHT and MEDIUM CASES of DIABETES: 8 to 12 tablets per day, in three separate doses immediately before meals.

SEVERE CASES of DIABETES: As an adjuvant to insulin, suppressing 1/3 of the units: 12 tablets per day, in three separate doses, immediately before meals.

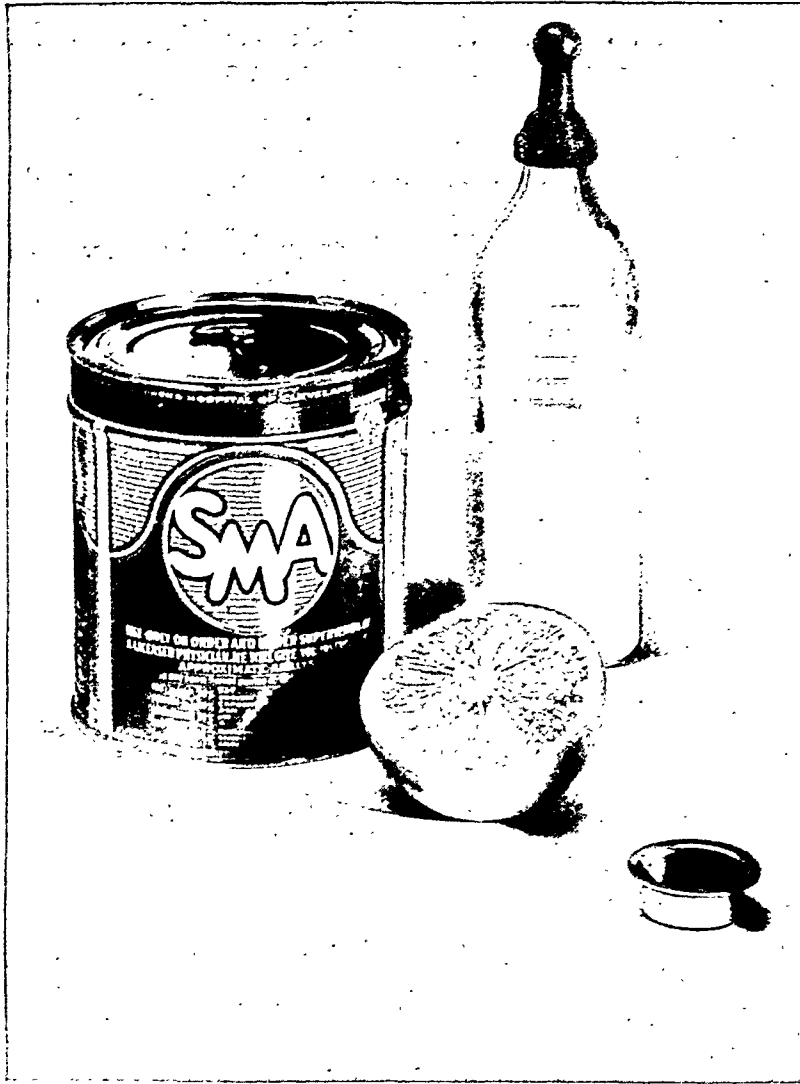
DERMATOSES: Eczema, acne, furunculosis, urticaria: 9 tablets per day, in three separate doses, immediately before meals.

FATTENING CURES: Tuberculosis, etc.: 8 tablets per day, in three separate doses, immediately before meals.

Each tablet contains 0 grm. 40 extract of the germs of barley, the germination of which is carried out under rigidly controlled conditions and temperatures.

General Agent:

L. BOUDOT, 8955 Routhier St., Montreal, P.Q., Tel. DUpont 4350



RESULTS—SIMPLICITY

BREAST MILK



from the Normal
Mother is the
IDEAL FOOD
for the
Human Infant

S.M.A. is a food for infants—derived from tuberculin tested cows' milk, the fat of which is replaced by animal and vegetable fats including biologically tested cod liver oil, with the addition of milk sugar and potassium chloride, altogether forming an antiscorbutic food. When diluted according to directions, it is *essentially similar to human milk* in percentages of protein, fat, carbohydrates and ash, in chemical constants of the fat and in physical properties.

That Is Why S.M.A.

is made to resemble BREAST MILK

in percentages of carbohydrate, protein, fat and total salts (ash) content, and why even the chemical and physical constants of the fat in S. M. A. are like those of breast milk fat.



W. LLOYD WOOD, Ltd., Toronto - Canadian Distributors for S. M. A. CORPORATION

The Canadian Medical Protective Association

PRESIDENT - JOHN F. ARGUE, M.D.

A mutual medical defence union founded in 1901 at the Winnipeg meeting of the Canadian Medical Association, incorporated by act of Dominion Parliament February 1913, and affiliated with the Canadian Medical Association 1924.

OBJECTS: To assist in the defence of its members in cases of alleged malpractice, and to encourage honourable practice in the daily work of the medical profession. The annual fee is five dollars per calendar year, half-rates after July first.

Subject to our by-laws, assistance is given by the payment of the taxable costs of actions together with reasonable counsel and witness fees in cases undertaken by our Association, as well as damages if awarded. All members in good standing of the Canadian and various Provincial Medical Associations may be enrolled upon signing the application form and paying the annual fee. All other regularly qualified practitioners must have their application countersigned by two members of our Association. Blank application forms and other literature upon request.

ADDRESS ALL CORRESPONDENCE TO THE SECRETARY-TREASURER

SUITE 401 - 180 METCALFE STREET, OTTAWA, CANADA

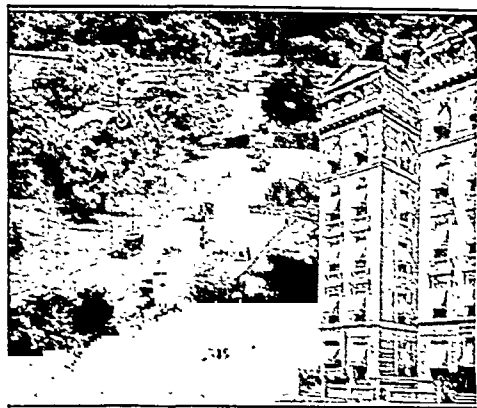
CHARLES B. TOWNS HOSPITAL

293 Central Park West New York, New York

For ALCOHOLISM and DRUG ADDICTION

ANY
PHYSICIAN
having an
addict prob-
lem is invited
to write for
Hospital lit-
erature.

This institution has specialized in addictions for over 30 years. Its method of treatment has been fully described in THE JOURNAL A. M. A.; in The Handbook of Therapy, from the A. M. A. Press; and in other scientific literature. The treatment is a regular hospital procedure, and provides a definite means for eliminating the toxic products of alcohol and drugs from the tissues. A complete Department of Physical Therapy, with gymnasium and other facilities for physical rebuilding, is maintained. Operated as an "open" institution. Physicians are not only invited but urged to accompany and stay with their patients.



Located Directly
Across from Central Park

London School of Hygiene and Tropical Medicine

(University of London)
Incorporating the Ross Institute

Diploma in Tropical Medicine
and Hygiene (Eng.)

Dates of the Courses, 1936

(Each part can be taken independently but not concurrently)

Section A. (Clinical and Laboratory Instruction)—
6th January - 27th March - 6th April -
26th June and in October.

Section B. (Tropical Hygiene)—
20th January - 20th March - 20th April -
19th June and in January, 1937.

Fees (inclusive): Section A, £25; Section B, £15.

Diploma in Psychology (Industrial)
Special courses of study by arrangement.

Diploma in Public Health

Course of study (whole-time, nine months), com-
mencing in September—inclusive fee, 54 Guineas.

Diploma in Bacteriology

Course of study (whole-time, one academic year)
commencing in October—inclusive fee, £47, 15s.

Epidemiology and Vital Statistics

Special three-monthly advanced courses—inclusive
fee, 7 Guineas.

For Prospectuses and Synopses of Lectures, etc.,
apply to SECRETARY, LONDON SCHOOL OF
HYGIENE AND TROPICAL MEDICINE, Keppel
Street (Gower Street), London, W.C.1.



For The "CURE"
White Sulphur
Springs west virginia

European Baths ~ American Facilities

The Greenbrier and Cottages
open all year round

DR. GUY HINSDALE, Director
Medical and Bath Department

L. R. JOHNSTON
General Manager

TRUSSES

The Spot-Pad, Non-Skid truss has been developed during 42 years of manufacturing. It is the result of a conscientious attempt to furnish an entirely practical, safe, comfortable and sanitary appliance of the highest quality.

Also Makers Of

Airway Surgical Supports Umbilical Trusses
Maternity Supporters
Non-Skid Arch Supporters Crutches

Professional Discount

OTTAWA TRUSS CO. of Canada Limited
304 Wellington Street - Ottawa

Columbia University New York Post-Graduate

Medical School

Seminar of one Month in
PEDIATRICS

Under the direction of Dr. Adolph G. DeSanctis
Beginning April 1, 1936

A full-time course of thirty-nine hours a week. The course includes lectures and clinics in pediatrics, practical pediatrics in the wards and dispensary, physical diagnosis, infant feeding, communicable diseases, malnutrition, cardiac diseases, tuberculosis in childhood, gastrointestinal disorders, etc.

A clinical course of one month in pediatrics will be given during March and May.

For further information, address

The Director,
311 East 20th Street, New York City

Cook County Graduate School of Medicine

(IN AFFILIATION WITH COOK COUNTY HOSPITAL)

Announces Continuous Courses

MEDICINE—Informal Course; Personal Courses; Intensive Course Two weeks starting April 13th.

SURGERY—General Course One, Two, Three and Six Months; Intensive Course Surgical Technique every two weeks; Special Courses.

GYNECOLOGY—Three Months Course; Intensive Course Two Weeks; Combined Course Four Weeks Gyn. & Obst. starting May 4th.

OBSTETRICS—Informal Course; Intensive Course Two Weeks; Combined Course Four Weeks Gyn. & Obst. starting May 4th.

FRACTURES AND TRAUMATIC SURGERY—Informal Practical Course; Intensive Course Ten Days starting April 13th.

PEDIATRICS—Informal Course; Personal Courses.

EAR, NOSE AND THROAT—Informal Course; Intensive Course Two Weeks starting April 6th.

UROLOGY—General Course Two Months; Intensive Course Two Weeks; Special Courses.

CYSTOSCOPY—Intensive Course every two weeks (Attendance limited).

General, Intensive and Special Courses in Tuberculosis, Ophthalmology, Roentgenology, Dermatology and Syphilology, Pathology, Neurology, Electrocardiography, Topographical and Surgical Anatomy, Physical Therapy, Gastro Enterology, Allergy, Hemorrhoids and Varicose Veins.

Teaching Faculty—Attending Staff of Cook
County Hospital

Address: Registrar
427 South Honore Street, Chicago, Illinois

SANATORIUM PRÉVOST Inc.

CARTIERVILLE (Montreal)

FOUNDER; THE LATE DR. ALBERT PRÉVOST

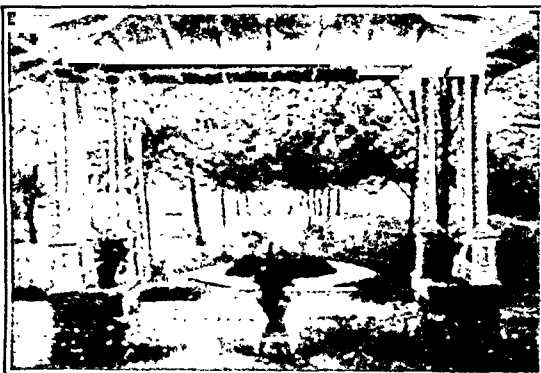
Médecin Légal de la Faculté de Paris

Professor of Neurology, University of Montreal

Professor of Nervous Diseases, Notre Dame Hospital, Montreal

MEDICAL DIRECTOR; DR. E. LANGLOIS

All diseases of the nervous system. Convalescence, Treatment of intoxications. Diseases resulting from malnutrition.



VIEW FROM THE VERANDA—THE BEAUTIFUL ALLEY SHOWN
LEADS TO THE RIVER



EXTERIOR VIEW—MAIN BUILDING

The Sanatorium is built on a large piece of ground 400,000 square feet, extending from Gouin Boulevard to Rivière des Prairies. Built at the centre of this private park, the two pavilions of the Sanatorium are isolated from the road and the river by two large pieces of land. Beautiful trees shade the private grounds and in every respect the sanatorium is well situated to provide that rest and quietness so necessary to the patient's cure.

Telephone: Sanatorium Prévost, Bywater 1240
Dr. E. Langlois - Lancaster 4455

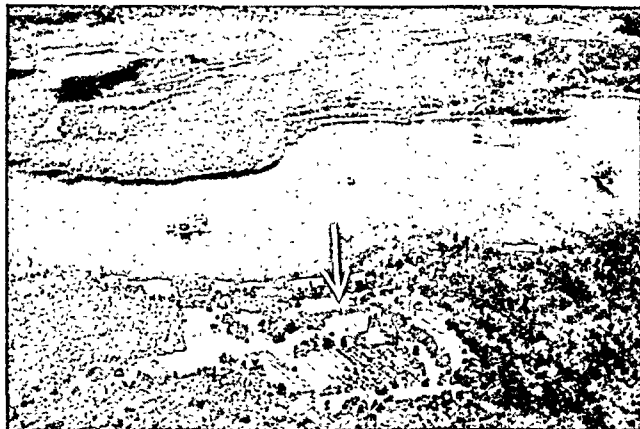
Prospectus sent on request

NEW ENGLAND SANITARIUM

(MELROSE P.O.) STONEHAM, MASS.

Ideal location on the shores of large lake, eight miles from Boston, in midst of 4,500 acre State Park. Overnight from nearly all points in Eastern Canada. Reasonable rates.

One hundred forty Pleasant, Home-like Rooms. Six resident Physicians, Seventy Trained Nurses. Experienced Dietitians and Technicians.



Aerial View—Arrow denotes buildings and 40 acres of spacious grounds



Main entrance

Scientific Equipment for Hydrotherapy, Electrotherapy and X-Ray, Occupational Therapy, Gymnasium, Golf, Solarium. Full health examinations and careful diagnosis. No Mental, Tubercular or Contagious diseases received. Physicians are invited to visit the institution. Ethical co-operation. Member American Hospital Association.

For booklet C and detailed information address:
W. A. RUBLE, M.D., L.R.C.P., L.R.C.S. (Edin.)
Medical Director

THE BURGESS PAVILION VERDUN PROTESTANT HOSPITAL

Verdun, Montreal, Que.

A private sanitarium for the treatment of diseases of the nervous system. Selected cases of alcoholism and drug addiction are also received. Amid quiet country surroundings with spacious grounds it is only fifteen minutes from the centre of Montreal. Modern in construction with hydrotherapeutic and electrotherapeutic equipment.



*For information as to rates, etc.
address:*

Dr. C. A. Porteous
P. O. Box 4019, Montreal, Que.

LOVAT HALL LANCASTER, ONTARIO

A private Sanitarium devoted to the treatment of convalescents, people run down in health and nervous, alcoholic and drug cases and mental patients of milder type.

Two houses comfortably and artistically furnished.

Patients classified according to nature of ailment.

The estate comprises 48 acres of lawns, woods and gardens.

LARGE SOLARIUM OVERLOOKING
LAKE ST. FRANCIS.
NO INSTITUTIONAL ATMOSPHERE.

Golf, Tennis, Badminton, Occupation.
Hydrotherapy, Electrotherapy,
Psychotherapy.

A. G. MORPHY, B.A., M.D.
Medical Director

THE FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION

No. 1, Wimpole Street, London, W. 1.

with which is associated some 50 General and Special Hospitals in London, is prepared to offer the following facilities to qualified practitioners:

- I General Courses are arranged covering all branches of Medicine and Surgery. These Courses occupy the student for several hours every day and last for two weeks.
- II Rota of teachers, giving personal tuition at hospital clinics, is arranged and full details are available on application.
- III Special Courses are arranged at the Special Hospitals associated with the Fellowship, and permit of intensive study in one specialty for a period ranging from 1 week to one month.

Provisional Courses in 1936.

Medicine	Mar. 21 & Mar. 22.—Miller General Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
<i>(Week-end Course)</i>	
Infants' Diseases	Mar. 23 to Apr. 4.—Infants' Hospital. Afternoons. Fee £3. 3s. 0d.
Ophthalmology	Mar. 23 to Apr. 4.—Royal Eye Hospital. Afternoons. Fee £1. 1s. 0d.
Urology	Mar. 28 & Mar. 29.—All Saints Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
<i>(Week-end Course)</i>	
April 13th, EASTER MONDAY.	
Heart and Lungs	Apr. 18 & Apr. 19.—Victoria Park Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
<i>(Week-end Course)</i>	
Proctology	April 20 to April 25.—St. Mark's Hospital. All day. Fee £3. 3s. 0d.
Psychological Medicine	April 27 to May 30.—Maudsley Hospital. Afternoons. Fee £5. 5s. 0d.
Medicine, Surgery and Gynaecology	April 27 to May 9.—Royal Waterloo Hospital. All day. Fee £3. 3s. 0d.
M.R.C.P. (Chest)	June 15 to July 11.—Brompton Hospital. Two afternoons weekly. 5 to 6.30 p.m. Fee £3. 13s. 6d. (<i>Limited to 6 per class</i>).
Fevers	June 20 & June 21.—Park Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
<i>(Week-end Course)</i>	<i>(Limited to 20).</i>
Surgery	June 27 & June 28.—Prince of Wales's General Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
<i>(Week-end Course)</i>	
Children's Diseases	July 4 & July 5.—Princess Elizabeth of York Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
<i>(Week-end Course)</i>	
Proctology	July 6 to July 11.—St. Mark's Hospital. All day. Fee £3. 3s. 0d.
Heart and Lungs	July 11 & July 12.—Victoria Park Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.
<i>(Week-end Course)</i>	
Dermatology	July 13 to July 25.—Hospital for Diseases of the Skin, Blackfriars. Afternoons. Fee £1. 1s. 0d.
Urology	July 13 to Aug. 1.—All Saints Hospital. Afternoons and evenings. Fee £2. 12s. 6d.

* Open to non-members.

Copies of all Special Course syllabuses and of the General Course Program may be obtained on application. The Hospitals reserve the right to make any alterations necessary in dates and fees. Post-graduates are advised, therefore, to make early enquiry. Other courses are arranged from time to time, in addition to the above list.

Courses are open only to Members of the Fellowship of Medicine; the annual subscription (from the month of joining) is £1. 1s. 0d., which includes the subscription to the *Monthly Post-Graduate Medical Journal*. Overseas subscription, to the Journal only, is 12/- per annum, post free. Every effort is made to assist Members to obtain the post-graduate work they require.

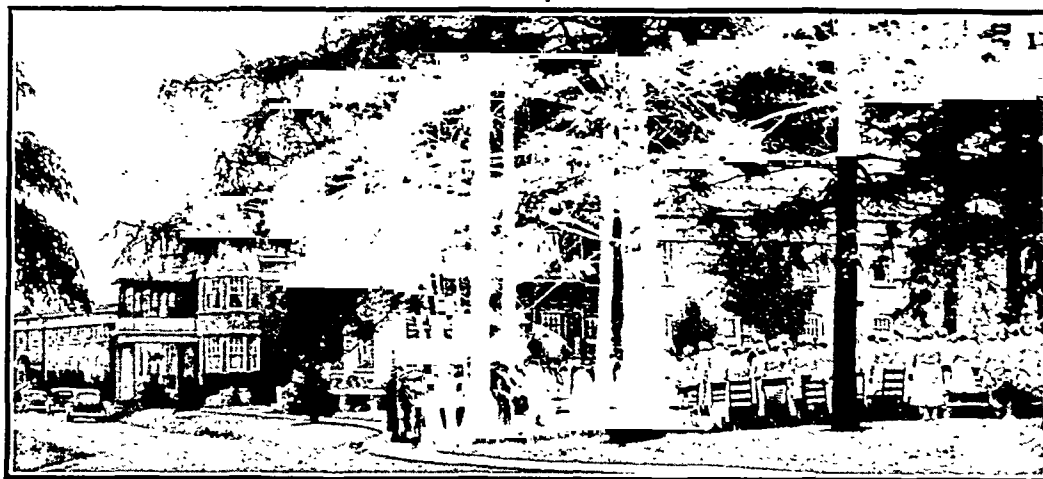
H. U. MORLOCK, M.C., M.D., M.R.C.P.,

DAVID LEVI, M.S.

Honorary Secretaries

HOMewood SANITARIUM

GUELPH, ONTARIO



HOMewood is a private hospital for nervous, mental and habit cases; specially equipped to provide all forms of treatment, such as;—Occupational Therapy, Electrotherapy, Hydrotherapy, Massage and games, (tennis, bowling, croquet, bridge, billiards, etc.)

30 ACRES of natural park, lawns and flower gardens.

Write or telephone for booklet and rates.

ADDRESS: DR. HARVEY CLARE, Medical Superintendent, Guelph, Ontario
PHONE GUELPH 53

McGill University

MONTREAL

FACULTY OF MEDICINE

C. F. Martin, B.A., M.D., C.M., LL.D., Dean

Beginning with the Session 1936-37 the course of study leading to the degree of M.D., C.M., will comprise *four* academic years of nine months each. Following this, the graduate will be required to spend one year as an interne in an approved hospital or a year of further study in the Faculty of Medicine of McGill University, or in another medical school approved by it, before he can obtain a certificate of eligibility for licensure.

Opportunities for graduate study are offered in the basic medical sciences and in the clinical fields and courses leading to the M.Sc. and Ph.D. degrees are given under the direction of the Faculty of Graduate Studies and Research.

A practical course leading to the Diploma of Public Health is open to medical graduates and Public Health Officers.

Full particulars of entrance requirements, fees, curriculum, etc. are given in the Annual Announcement which may be obtained on application to

PROF. J. C. SIMPSON

Secretary of the Faculty of Medicine

THE NEW YORK POLYCLINIC MEDICAL SCHOOL AND HOSPITAL

(ORGANIZED 1881)

(The Pioneer Post-Graduate Medical Institution in America.)

OBSTETRICS, GYNECOLOGY and ALLIED SUBJECTS

A full time course. In Obstetrics: Lectures, prenatal clinics, witnessing normal and operative deliveries, operative obstetrics (manikin). In Gynecology: Lectures, touch clinics, witnessing operations, examination of patients pre-operatively, follow-up in wards post-operatively. Obstetrical and Gynecological pathology. Regional anesthesia (cadaver). Attendance at conferences in Obstetrics and Gynecology. Operative Gynecology (cadaver).

FOR THE GENERAL SURGEON

A combined surgical course comprising General Surgery, Traumatic Surgery, Abdominal Surgery, Gastro-Enterology, Proctology, Gynecological Surgery, Urological Surgery, Thoracic Surgery, Pathology, Roentgenology, Physical Therapy, Operative Surgery and Operative Gynecology on the Cadaver.

EYE, EAR, NOSE and THROAT

Proctology, Gastro-Enterology and ALLIED SUBJECTS

FOR INFORMATION ADDRESS

MEDICAL EXECUTIVE OFFICER, 345 West 50th St., New York City



Hollywood Sanitarium

New Westminster, British Columbia

For the treatment of Nervous, Alcoholic, Toxic, Neurologic and Psychopathic cases exclusively.

Reference: B.C. Medical Association

*Write for prospectus and rates to the
Medical Superintendent.*

POST GRADUATE STUDY

For Canadian and American Practitioners

Are you preparing for any Medical, or Surgical Examination?

Send Coupon below for valuable publication

"GUIDE to MEDICAL EXAMINATIONS"

PRINCIPAL CONTENTS

The Examinations of the Conjoint Board.
The M.D. Degrees of all British and Colonial Universities.
How to pass the F.R.C.S. Examination.
The M.R.C.P. London and Edinburgh.
The D.P.H. and how to obtain it.
The Diploma in Tropical Medicine.
Diploma in Ophthalmology.
Diploma in Psychological Medicine.
Dental Examinations.

You can prepare for any of these qualifications by postal study at home and come up to Great Britain for examination. We specialize in Post-graduate tuition. Clinical and practical courses in England arranged.

THE SECRETARY MEDICAL CORRESPONDENCE COLLEGE

19 Welbeck Street,
Cavendish Square, London, W.1.

*Sir,—Please send me a copy of your
"Guide to Medical Examinations"
by return.*

Name

Address

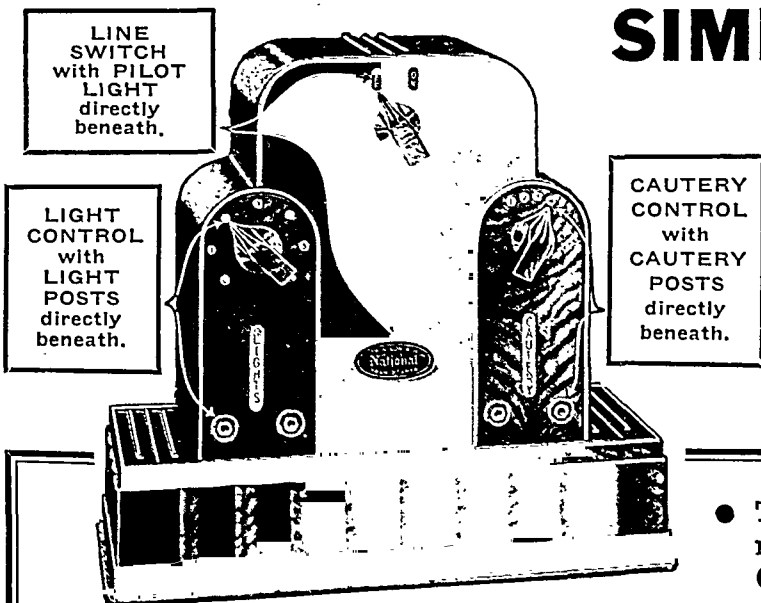
Examination in which interested
C.M.A.

SIMPLIFIED CONTROL CAUTERY

by **National**

featuring

"The Hidden Shelf"



The ONLY cautery with the "Hidden Shelf", a compartment for the compact storage of cautery accessories.

Price \$43.45 Complete

Including: Illuminated "Trigger" Cautery handle; "Gyn-a-lite" clip set; transformer case of molded Bakelite; "Hidden Shelf". Choice of 3 tips.

- The NEW National is the most IMPRESSIVE, most COMPLETE cautery ever developed. NO OTHER CAUTERY so easy to operate.
- A larger, sturdier, Heavy-Duty cautery that covers every cautery and diagnostic light requirement. Built to last a life-time.
- The ONLY cautery supplied with the Gyn-a-lite vaginal speculum clip set.
- The ONLY cautery handle with the illuminator located below the field of vision and entirely out of the line of sight.

National Electric Instrument Co.

36-16 SKILLMAN AVENUE
LONG ISLAND CITY, N. Y.

Prescribe

EFEMIST (HART)

*for the relief of
Nasal Congestion*



Efemist is both water and tissue fluid soluble.

Affords maximum Ephedrine action without irritation.

Prove to yourself the superiority of Efemist.

Send for Complimentary
Bottle — Now

Laurentian Laboratories, Limited,
560 De Courcelles Street, St. Henry, Montreal.

Please send me complimentary bottle EFEMIST (Hart) for clinical trial.

.....M.D.

BAD-NAUHEIM

DEUTSCHLAND (Germany)

*Affections of the Heart and blood
vessels, Rheumatism*

Naturally - warm carbonic-acid springs with saline contents.

Balneological Institute and William G. Kerckhoff-Institute, a combined place of research on affections of the Heart and blood vessels.

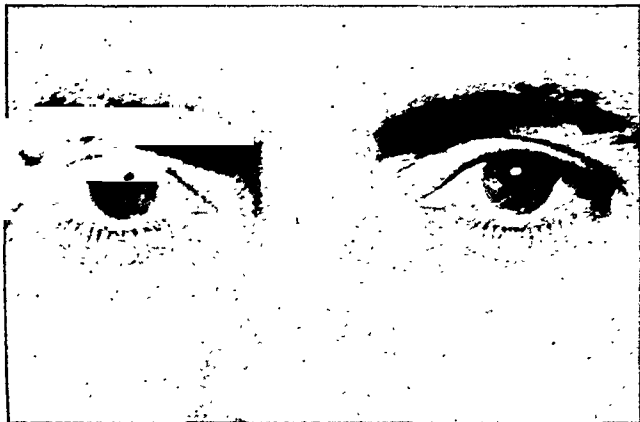
Special terms for physicians and their families

For all particulars apply to

Kurverwaltung Bad-Nauheim

Why the Eyes

accommodate more quickly
to the Patterson Type B
Fluoroscopic Screen . . .



APPLE-GREEN is the color of the Type B Fluoroscopic Screen—a color to which the eye will accommodate more quickly. Many radiologists have found this TYPE B feature to be of great advantage—particularly those doctors whose work frequently takes them in and out of the fluoroscopic room.

★

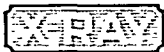
MOST important of all advantages of the Patterson Type B Fluoroscopic Screen is its unexcelled brilliancy. It is far more brilliant than all previous fluoroscopic screens.

Other advantages of the Patterson TYPE B which appeal greatly to radiologists are the all-around sharper detail and operation at lower X-ray intensities.

Roentgenologists who have used the Patterson TYPE B are unanimous in their praise of it. Ask your dealer for a demonstration.

THE PATTERSON SCREEN COMPANY
DEPT. C. M. A. J., TOWANDA, PENN., U. S. A.

Patterson



INTENSIFYING **Screens** FLUOROSCOPIC

SCREEN SPECIALISTS FOR MORE THAN 20 YEARS

Fast—

Superior in Detail—

Uniform!



BRITISH MADE

Ilford X-Ray Film

has received the stamp of approval of leading roentgenologists, who judge an x-ray film by its ability to produce good, clear, diagnostic radiographs CONSISTENTLY.

Complete stocks carried by

VICTOR X-RAY CORPORATION

 of Canada, Ltd. 

Distributors for General Electric X-Ray Corporation

TORONTO—30 Bloor St. W., Toronto, Ont. • MONTREAL—324 Medical Arts Bldg. • VANCOUVER—Motor Transportation Bldg. 370 Dunsmuir St. • WINNIPEG—Medical Arts Bldg. Wholesale Warehouse 359 St. Paul St. W., Montreal, P. Q.



WHY CAMP SUPPORTS ARE SCIENTIFICALLY DESIGNED

THE Camp designing staff—with a combined experience of many years in the surgical support field—is constantly endeavoring to render in Camp garments the objectives of various groups of specialists consulted, as well as professional suggestions relayed by Camp nurses detailing all over the world and by Camp dealers.

From the eastern seaboard three years ago and a little later from the West and Midwest came this suggestion from obstetricians: the desirability of a diagonal pull, in addition to the straight around attachments, in a garment designed to support the abdominal walls without disturbing the relationship of the fetus to the pelvis. To effect this abdominal support, and at the same time to provide proper back support, was a task involving considerable difficulties. However, approximately twelve months later—after numerous conferences, many adjustments and trial by various pregnant patients—a new series of prenatal supports was completed, prenatal supports with a diagonal pull, proved by X-ray to support properly the abdominal walls without constriction at any point.

A comparable situation arose with a number of different internists. The desirability of a garment to fit snugly—without discomfort—over thin, protruding hip bones and yet to hold the abdominal organs as high as possible, was obvious from requests by physicians who had prescribed and found wanting in these respects many visceroptosis garments. To provide such a garment involved the manufacture of a specially made material pliable enough to fit like a hood over the crest of the ilium and sufficiently firm to support the abdominal organs. Only after two years of collaboration and painstaking investigation was there ready for distribution a series of such garments.

Thus is the designing room at the Camp factory a veritable melting pot of professional desires and design possibilities. This is why Camp supports are scientifically designed.

S. H. CAMP & COMPANY of CANADA, Ltd.

Manufacturers

Windsor, Ontario, Canada



CAMP PROFESSIONAL SUPPORT SERVICE

Accepted by the Council on Physical Therapy
of the American Medical Association

WHOOPING COUGH The Paroxysmal Stage

R Vapo-Cresolene (specially prepared cresols of coal tar) sedative, antiseptic, antispasmodic, penetrating.

Vaporized at night to relieve the paroxysms at that time; the strength of the patient will be conserved.

An inhalant of known dependability. Introduced in 1879.

Controls cough in broncho-pneumonia and bronchitis. Dyspnoea in spasmodic croup and bronchial asthma.



Write for special discount to physicians and informative Treatise, "Effective Inhalation Therapy."

THE VAPO-CRESOLENE CO.

504 St. Lawrence Boulevard, Montreal

Name

Street

Address

SMOOTH as Velvet

Williams Luxury Shaving Cream is a product of nearly a century of experiment by shaving specialists. Physicians recognize the purity of its ingredients. They also appreciate the smooth, close shave it gives.

- To keep the face as Williams leaves it, use Aqua Velva, Canada's greatest after shaving preparation.

Williams

Shaving Cream • Aqua Velva



MAPHARSEN



A REFINEMENT OF THE ARSENICAL THERAPY OF SYPHILIS

Parke, Davis & Company introduces to the medical profession a new antisyphilitic arsenical, the result of co-operative research conducted by two university groups and the Research Staff of Parke, Davis & Company.


Mapharsen is the hydrochloride of meta-amino-para-hydroxy-phenylarsine oxide. Extensive clinical data demonstrate that it is an efficient antisyphilitic agent. Reactions following its administration have on the whole been less severe than those observed after the injection of other commonly used arsenicals.

The Parke-Davis Research Laboratories have subjected Mapharsen to rigid chemical and pharmacological testing, including tests for trypanocidal and spirocheticidal potency. A review of this work, together with a complete discussion of the clinical evaluation of Mapharsen and its use in the treatment of syphilis, has been included in our new booklet; a copy will be sent to any physician on request.

Mapharsen has been accepted by the Council on Pharmacy
and Chemistry of the American Medical Association.



PARKE, DAVIS & COMPANY · WALKERVILLE, ONTARIO



ACNE associated with adolescence responds more readily to this dietary aid

In one large clinic, it resulted in satisfactory clearing of lesions in 89% of cases

For years physicians have been prescribing Fleischmann's fresh Yeast for the acne of adolescence. As a supplement to usual medical treatment in severe cases, they find it speeds complete recovery. In milder types, it is often sufficient as the sole therapeutic measure.

Many tests have been made by doctors to determine the effect of daily yeast feeding on skin lesions. In one large clinic, 89% of cases of the adolescent type of acne were satisfactorily cleared up.

THE hyperactivity of the endocrine system at puberty and during adolescence is reflected in the secretions of the sebaceous glands. The sebum may change in both quality and quantity. As a result *acne vulgaris*, of varying degrees of intensity, commonly appears at this time in those areas where the sebaceous glands are most abundant—the face, the shoulders, the chest. Bloch* has reported the presence of acne in 64% of 4,191 boys and girls between 8 and 19 years of age.

The clinical importance of acne vulgaris is obvious when its possible effects are considered:

1. When *acne vulgaris* is neglected during adolescence, it may become a chronic condition and persist well on into middle life.
2. There is always the possibility of permanent scarring from persistent *acne vulgaris*.
3. Adolescent boys and girls are so often embarrassed by a "pimply skin" that they develop a lasting feeling of inferiority.

Other Factors which Influence the Development and Persistence of Acne . . .

In addition to the primary effect of gland hyperactivity on the skin, the general health and diet of the young boy and girl play important rôles in the etiology of acne vulgaris.

Irregular hours and habits, lack of discrimination in choice of foods, over-indulgence in sweets and fats are all common problems of adolescence. As a result, gastro-intestinal difficulties are often present—principally constipation.

What Fleischmann's Yeast Will Do

Fleischmann's fresh Yeast supplies essentials which are most needed at adolescence. It contains four of the five important vitamins, *i.e.*, Vitamins A, B, G, and D. It is an especially rich source of B and G. It also supplies amino-acids, vital to growth processes. In addition, being fresh yeast, it supplies hormone-like substances which stimulate gastric secretions, thus aiding measurably in the digestion and assimilation of food.



UNLESS CLEARED UP quickly, *acne vulgaris* may become a chronic condition—leaving permanent scars. Boys and girls are often so embarrassed by this malady that they develop a lasting feeling of inferiority.

By its beneficial action on the secretions and musculature of the gastro-intestinal tract, Fleischmann's Yeast speeds up the elimination of waste products in a natural way. Thus fewer toxins are thrown into the blood stream to act as irritants to the skin.

★ ★ ★ ★

Moreover, its vitamins have a regulating effect on the gland dysfunction associated with acne, *i.e.*, dysfunction often characterized by increased thyroid activity to compensate for gonad activity due to imbalance of the endocrines.† Vitamins B and G in yeast have also a direct vitalizing effect on the tissues themselves, enabling the skin to throw off the lesions, healing itself more quickly, hence with less danger of scarring.

In addition to a speedier recovery from the skin lesions, doctors find that Fleischmann's Yeast improves the general health and tone of patients. There is a feeling of greater aliveness and alertness, an increase in the sense of "well-being." The recommended method of yeast therapy is: 2 cakes of Fleischmann's fresh Yeast daily, plain or dissolved in $\frac{1}{2}$ glass of Water, preferably half an hour before meals.

Buy Made-in-Canada Goods

* BLOCH, Bruno, "Metabolism, Endocrine Glands and Skin Diseases, with special reference to Acne Vulgaris."

British Journal of Dermatology, Feb. 1931.

† HOLLANDER, Lester, "The Rôle of the Endocrine Glands in the Etiology and Treatment of Acne."

Archives of Dermatology and Syphilology, 3: 393-597, March 1921.



Even though bottle days over
Dionne Quintuplets
 continue using *IRRADIATED*
Carnation Milk

SINCE November 28th, 1934 the Dionne Quintuplets have been getting Carnation Evaporated Milk. During that time they have used over 2,500 tall tins. While they have stopped bottle-feeding, they still get Irradiated Carnation Milk in their mugs, on their cereals and in other cooked foods.

Carnation Co. Limited, Toronto, Ontario



WRITE FOR "Simplified Infant Feeding", a new and authoritative publication for physicians.



IRRADIATED
Carnation
Milk

A CANADIAN PRODUCT • "FROM CONTENTED COWS"

A Stimulating Expectorant For Coughs Due To Colds

Creo-Terpin Comp. owes its popularity and extensive usage to the effective combination of creosote and terpin hydrate with glycerophosphates and codeine.

This formula eases cough by soothing and disinfecting the irritable bronchial mucous membrane, and builds general resistance. When cough is due to cold or bronchial irritation the relief is prompt and permanent. Creo-Terpin Comp. does not disturb digestion.

Samples for clinical trial free to physicians.

HENRY K. WAMPOLE & CO. LTD.

Manufacturing Pharmacists

PERTH, ONTARIO, CANADA

For
DIABETES

STARCH-FREE BREAD
FOR DIABETICS—EASILY MADE AT HOME
FROM **LISTERS**
STARCH-FREE
FLOUR

ADVERTISED
only to the
MEDICAL
PROFESSION

Large carton Listers Flour (enough for 30 bakings), \$4.85. Small carton Listers Flour (enough for 15 bakings), \$2.75. Please ask us for the name of the nearest Lister Depot or order direct from

LISTERS LIMITED · Huntingdon, Quebec



THE X-RAY ANSWERS THIS QUESTION

When you prescribe the application of solutions to the nasal cavity, you expect these medicaments to reach the surfaces where they will afford the greatest relief. Obviously the area of the upper and middle turbinates should be covered.

X-Rays prepared for us, indicate that solutions applied by dropper are unlikely to reach this area. This is especially true when home treatment is prescribed. On the other hand, solutions sprayed with a DeVilbiss Atomizer are spread throughout the entire nasal cavity. We shall be glad to send you literature on this subject.

DeVilbiss

The DeVilbiss Mfg. Co., Limited, Windsor, Ontario, headquarters for atomizers and vaporizers for professional and home use

For Full
HEMATINIC
Effect



Iron is clearly indicated in anemia, chlorosis, general convalescence, etc., but iron in a readily assimilable state is often difficult to find.

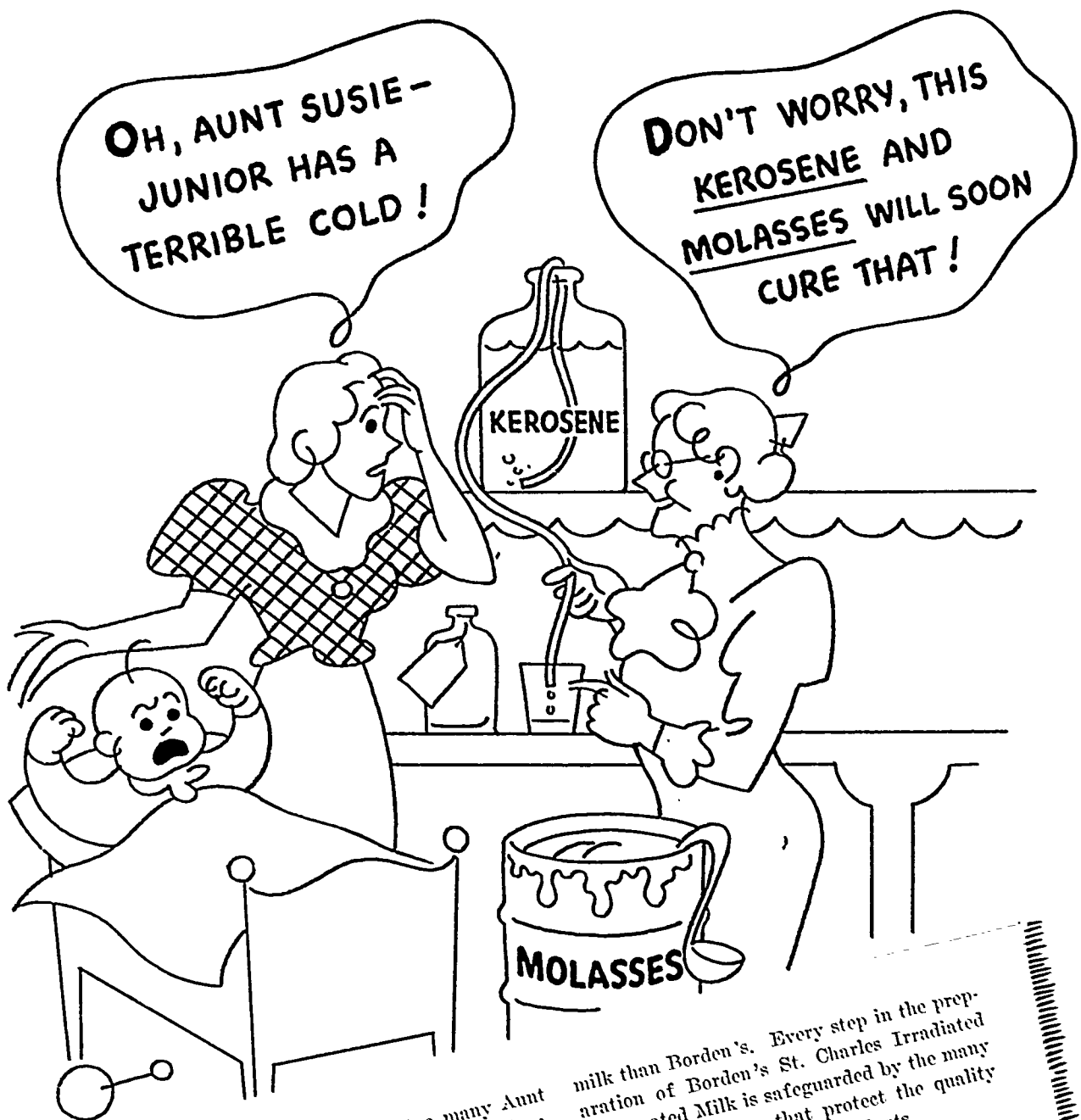
Hemaboloids Arseniated with Strychnia may be effectively prescribed in these cases. Its palatable iron compound, soluble in the alkaline media of the intestine, is ready for immediate absorption.

Hemaboloids (Plain) contains the same organic iron compound, and is indicated in milder anemias or where arsenic and strychnine are contra-indicated.

THE PALISADE MANUFACTURING
COMPANY, INC. ~ YONKERS, N. Y.

Canadian Dept. W. LLOYD WOOD LTD., Toronto, Ont.

*Hemaboloids and
Hemaboloids Arseniated
(with Strychnia)*



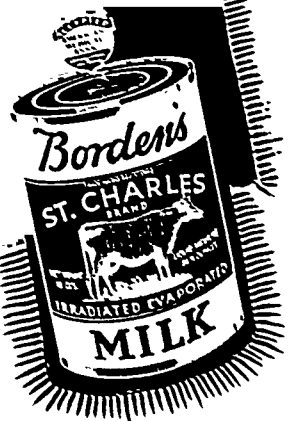
THERE ARE too many Aunt Susies in the world. Physicians, we believe, prefer to do their own prescribing! That's why Borden's St. Charles Irradiated Evaporated Milk never carries an infant feeding formula. Nor does the Borden Company advertise this milk directly to the laity for use in infant feeding. We believe that the form of milk, as well as the formula, should be left to the doctor to decide. But when, in your judgment, an evaporated milk should be used, we sincerely believe that you could prescribe no better

milk than Borden's. Every step in the preparation of Borden's St. Charles Irradiated Evaporated Milk is safeguarded by the many special precautions that protect the quality and purity of all Borden products.

Borden's St. Charles Evaporated Milk was accepted in 1930 by the American Medical Association Committee on Foods.

The Vitamin D content of Borden's St. Charles Evaporated Milk has been increased by direct irradiation with ultra-violet rays under Canadian Patents Nos. 291,138 and 306,562. Licensed by Wisconsin Alumni Research Foundation.

**Borden's IRRADIATED
ST. CHARLES EVAPORATED MILK**



Ergoapin^{ol} (Smith)

Breaks the vicious circle of perverted menstrual function in cases of amenorrhea, tardy periods (non-physiological) and dysmenorrhea. Affords remarkable symptomatic relief by stimulating the innervation of the uterus and stabilizing the tone of its musculature. Controls the utero-ovarian circulation and thereby encourages a normal menstrual cycle.

MARTIN H. SMITH COMPANY

150 LAFAYETTE STREET, NEW YORK, N. Y.

Full formula and descriptive literature on request



Dosage: 1 to 2 capsules 3 or 4 times daily. Supplied in packages of 20.

Ethical protective mark MHS embossed on inside of each capsule, visible only when capsule is cut in half at seam.

MOLSON'S ALE

FAMOUS FOR PURITY
AND WHOLESOMENESS

SINCE 1786

IN WHOOPING COUGH

And in other Persistent Coughs

ELIXIR BROMAURATE

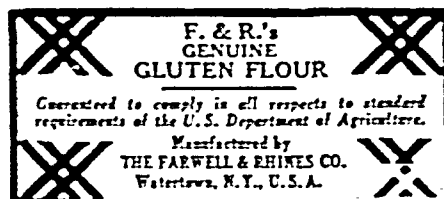
Cuts short the period of the illness, reduces the frequency of the attacks, relieves the distressing cough and gives the child rest and sleep.

Also valuable in BRONCHITIS and BRONCHIAL ASTHMA

(Relieves the cough in Pulmonary Tuberculosis)
IN FOUR-OUNCE ORIGINAL BOTTLES—A teaspoonful 3 to 4 times a day after meals or more often when necessary.

GOLD.—An interesting booklet on "Gold in the Treatment of Whooping Cough and Other Diseases" sent on request. Drop us a card.

GOLD PHARMACAL CO. — — NEW YORK



HYPERTENSION



—Will It Respond to

endocrine treatment? Yes, if of the functional type caused by failure of the hepatic detoxicating mechanism. No, if it is the result of sclerotic conditions, especially of the kidneys. In functional hypertension

ANABOLIN

(tablets or solution) will prove its worth in one week.



POINTS ABOUT ANABOLIN

- (1) Standardized
- (2) Water-white, crystal-clear solution
- (3) Entirely protein- and histamine-free

The HARROWER LABORATORY, Inc.

Canadian Distributors:

WILFRED G. NOBLE, LTD.

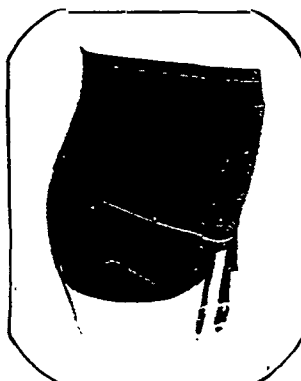
64 Gerrard St. East - Toronto 2

Trademark
Registered

STORM

Trademark
Registered

Binder and Abdominal Supporter



Gives perfect uplift. Is worn with comfort and satisfaction. Made of Cotton, Linen and Silk. Washable as underwear. Booklet shows three different "types" and many variations of each.

Picture Shows "Type N"

For Ptosis, Hernia, Pregnancy, Obesity, Relaxed Sacroiliac Articulations, High and Low Operations, etc.

Each Belt Made to Order.

Ask for Literature

Katherine L. Storm, M. D.

Originator, Owner and Maker

1701 Diamond Street

Philadelphia, Pa., U.S.A.

BACTERIAL ANTAGONISM

MAZON FOR ECZEMA

is definitely antagonistic to bacterial environs.

ITS APPLICATION

alleviates and promotes reconstructive processes without further irritation of the dermal structure.

IMMEDIATE and DEFINITE ACTION.

INDICATIONS:

Psoriasis
Alopecia
Ring Worm
Acne
Dandruff
Athlete's Foot
and Other Skin
Disorders



Photographed—3/17/31

• The pictures tell the story •

Psoriasis
Duration
2½ years.
Complete
elimination
2 months.
No recurrence
5 years.



Photographed—5/16/31

THERAPEUTICALLY MODERN:

Ease of Application Complete rapid absorption No bandaging
. Immediate pruritic relief Positive results.

TEST MAZON IN YOUR MOST SUITABLE CASE

Samples and literature on request.

Distributors
Wholesale Druggists

On sale
Dependable Pharmacies
1, 1½ and 4 ounce jars

LAURENTIAN AGENCIES
560 DeCourcelles Street
Montreal

Pneumonia—

WHEN pneumonia is first suspected, but not definitely established, the prompt application of an Antiphlogistine jacket is indicated in order, if possible, to inhibit its development.



Lung Tissue
firm and airless

Once the disease is established, the use of Antiphlogistine is helpful in carrying the patient safely through the crisis.

Antiphlogistine

Sample on request

The Denver Chemical Mfg. Co.
153 Lagauchetiere St. W., Montreal

*Antiphlogistine is hyper-
emic, decongestive and relaxant and promotes relief of pleuritic pain*



AYLMER Infant's Foods are prepared from carefully selected fruits and vegetables and packed individually in 4½ ounce cans.

Write for samples of any of the following varieties:

Peas	Spinach	Tomatoes
Beets	Apricots	Asparagus
Beans	Prunes	Carrots
Apple Sauce	Infant's Soup	

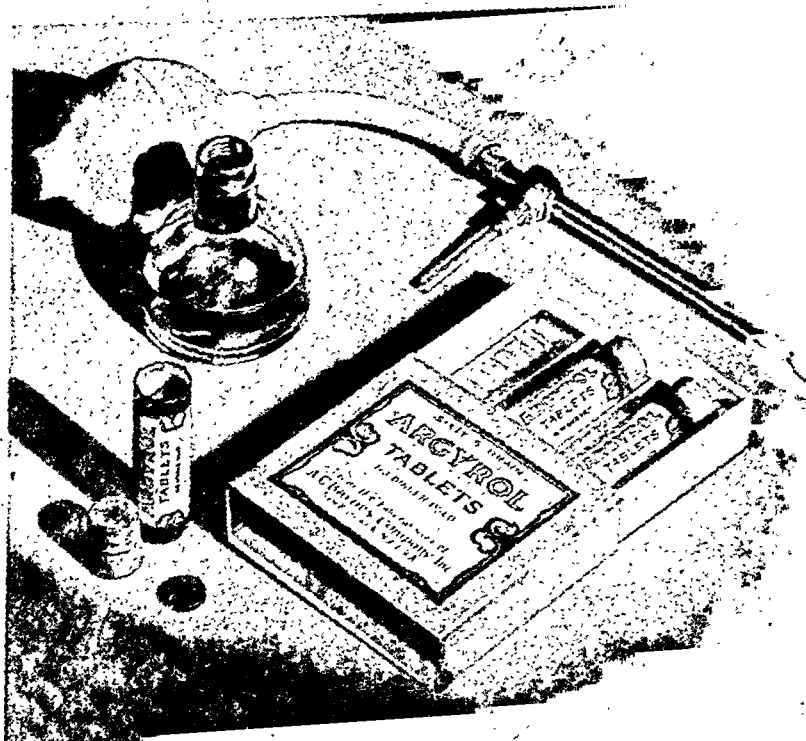
AYLMER Research Laboratory
CANADIAN CANNERS LIMITED
 HAMILTON CANADA



AYLMER

INFANTS FOODS

Spray Argyrol in Common Cold



At this time of year, with frequent exposure to cold and wet, the common cold takes on a more serious aspect. Tonsillitis, pharyngitis and sinusitis are frequent sequelæ when "dread Winter spreads his latest glooms".

The prevention of complications is the first aim of the physician. Early treatment with Argyrol not only attacks the infection right at its source, but also quickly relieves the acute distress in the respiratory tract.

The Dowling Argyrol pack and the Argyrol spray (20 per cent solution) have become standard therapy throughout the world. Rhinologists, following the Dowling technique, find the tampon saturated with

10-20 per cent Argyrol solution, the most effective when used as a local detergent and decongestive for the highly inflamed nasal tissues.

The new Argyrol tablets in small convenient vials are a great convenience in nose and throat practice. They not only insure accuracy, purity and genuineness, but also save time, because a fresh, potent solution is thus made available at a moment's notice, in the doctor's office, in the operating room and at the bedside. Four tablets dropped in one-half ounce of water make a 10 per cent solution in a few minutes; other strengths in proportion. Argyrol is a unique and original compound; no other silver salt is like it chemically.

A. C. BARNES COMPANY, LIMITED
STE-THERESE, P.Q.

For 35 years sole makers of Argyrol and Ovocerin. "Argyrol" is a registered trade-mark, the property of A. C. Barnes Co. Ltd.

Vol-34 NO-2



THERMO-FLEX catgut is flexible . . . flexible to the degree required for the most delicate work, and this flexibility is attained without sacrifice of other equally essential characteristics.

- There is no compromise in sterility . . . like all D&G sutures, Thermo-flex catgut is subjected to rigorous heat sterilization.
- It is free from oils, and thus is free from the hazard of knot slippage.

- Its moisture content is normal. Waterlogged catgut is unstable, with a progressive deterioration in strength.

A quarter century of suture specialization has proven to us that a balance of qualities, with each developed to the highest point of practicability, is more vital to correct function and unfailing dependability than a single predominating feature.

DAVIS & GECK, INC.

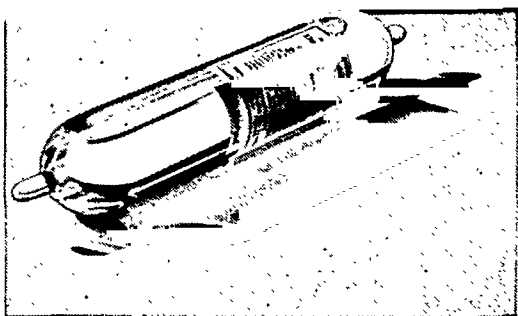
D&G THERMO-FLEX *Sutures*
(NON-BOILABLE)

OBTAINABLE FROM RESPONSIBLE CANADIAN DEALERS

CONTENTS CONTINUED FROM PAGE II

	Page		
RETROSPECT		LETTERS, NOTES AND QUERIES	
Milestones in the Recent Development of our Knowledge of Hearing and Balancing. <i>W. J. McNally</i>	195	Federation	
SPECIAL ARTICLE		Shakespeare, a Medical Prophet	
Givers of Life. <i>G. Fleming</i>	197	The Administration of Iron	
MEDICAL ECONOMICS		Vitalex	
Dominion Income Tax Returns	199	TOPICS OF CURRENT INTEREST	
Health Insurance as a Federal and Provincial Problem	201	Clinical Endocrinology	
MEN AND BOOKS		Reform in Radio Advertising	
The Cæsarean Section. <i>J. H. Couch and H. N. Couch</i>	201	MEDICO-LEGAL	
ASSOCIATION NOTES		Mutual Life Insurance Company of New York v. Dame Henriette Jeannotte-Lamarche	
Proceedings of the Executive Committee, October 31, 1935	202	ABSTRACTS FROM CURRENT LITERATURE	
Federation	208	Medicine	
HOSPITAL SERVICE DEPARTMENT NOTES		Surgery	
Interns from Unapproved Medical Schools	209	Obstetrics and Gynæcology	
Tuberculosis Control in British Columbia	209	Pædiatrics	
MEDICAL SOCIETIES		Oto-Rhino-Laryngology	
Calgary	210	Anæsthesia	
Chinese	210	Therapeutics	
Edmonton Academy of Medicine	210	Pathology and Experimental Medicine	
Montreal Dermatological	211	OBITUARIES	
Ontario Neuro-Psychiatric	211	C. R. Cuthbertson	228
Saint John	211	J. G. Day	228
Winnipeg	211	A. A. Forbes	228
UNIVERSITY NOTES		J. D. MacCallum	228
McGill	212	W. J. McCollum	228
Oxford	212	I. M. Lovitt	228
SPECIAL CORRESPONDENCE		P. P. McCormick	228
The London Letter	212	D. C. McLaren	228
The Edinburgh Letter	213	M. E. MacLeod	
		E. A. McDonald	
		S. N. Miller	
		L. J. O'Shaughnessy	
		T. J. Park	
		W. F. Park	
		M. A. B. Smith	
		J. T. Wright	
		NEWS ITEMS	
		Canada	232
		United States	234
		General	
		Book Reviews	2

Printed by MURRAY PRINTING COMPANY, LIMITED, 192 SPADINA AVENUE, TORONTO 2.



50 cc: 100 cc: 200 cc:

Physicians when using intravenous Dextrose must be assured that it is of the highest purity. Hence they prefer the ampoule product.

50% BUFFERED DEXTROSE SOLUTION

"Brand Synthetic"

MEETS THEIR EVERY REQUIREMENT

A C.P. Anhydrous preparation of unexcelled quality.

An ampoule will gladly be sent, also literature, on request.

INDICATIONS

Before and after Operation,
Collapse
Starvation,
Haemorrhage,
Hepatic Diseases, Etc.

SYNTHETIC DRUG CO. LIMITED

243 College Street, Toronto

Phone: Midway 8055

A Specific in
PREGNANCY

to prevent
DENTAL CARIES

and to maintain
**CALCIUM
BALANCE**

"It is obvious, therefore, that appreciable amounts of Vitamin D are not furnished by our present diets."

"It is evident, therefore, that our whole modern method of living tends to diminish the Vitamin D effect of sunshine."

Tisdall, Frederick F.

C.M.A.J., Vol. 33, No. 6, Dec. 1935, page 625

VITAMIN D

OSTOGEN

in its most economical form

15 c.c. and 6 c.c. BOTTLES
with precision dropper

DOSE
2 to 6 drops daily

Charles E. Frosst & Co.

MANUFACTURING PHARMACISTS SINCE 1899

MONTREAL

CANADA

The Canadian Medical Association Journal

The Official Organ of the Canadian Medical Association and of all Provincial Medical Associations of Canada

Editorial Office, 3640 University St. - Montreal

CENTRAL EDITORIAL BOARD

Editor, A. G. Nicholls, M.A., M.D., D.Sc., F.R.S.C., F.R.C.P.(C).

Assistant Editor, H. E. MacDermot, M.D., F.R.C.P.(C).

Managing Editor, F. S. Patch, M.D.

Maude E. Abbott; E. W. Archibald; A. T. Bazin; F. G. Finley; A. Grant Fleming; D. Schlater Lewis;
C. F. Martin; J. C. Meakins; L. C. Simard

CORRESPONDING MEMBERS

J. W. Crane; P. C. Dagneau; N. B. Dreyer; J. G. FitzGerald; J. Miller; Ross Mitchell; Alan Rankin.

CHAIRMEN OF PROVINCIAL EDITORIAL BOARDS

ALBERTA—G. E. Learmonth, Calgary.

NOVA SCOTIA—J. S. MacLennan, C. W. Holland.

BRITISH COLUMBIA—D. E. H. Cleveland, Vancouver.

ONTARIO—J. H. Elliott, Toronto.

MANITOBA—Ross Mitchell, Winnipeg.

P. E. ISLAND—J. A. McPhee, Summerside.

NEW BRUNSWICK—A. S. Kirkland, Saint John.

SASKATCHEWAN—Lillian Chase, Regina.

MEMBERSHIP including *Journal*, \$10.00. Subscription to *Journal* is \$6.00 and is limited to Libraries, Hospitals and doctors residing outside Canada. Volume commences with January and July Issues. Index in June and December Issues.

CONTRIBUTIONS

EXCLUSIVE PUBLICATION: Articles are accepted for publication on condition that they are contributed solely to this *Journal*. Arrangements for simultaneous publication may be made under exceptional circumstances.

COPYRIGHT: Matter appearing in the *Journal* is covered by copyright under the Copyright Act of 1921, but, as a general rule, no objection will be made to the reproduction in reputable medical journals of anything in these columns, provided proper credit is given.

WEDNESDAY PRINTING COMPANY, LTD. CONTRIBUTORS

MEMORANDUM FOR CONTRIBUTORS

MANUSCRIPTS: Should be typewritten, double-spaced, and the original copy submitted, otherwise they cannot be accepted.

REFERENCES: Should be arranged as follows:

In the case of a *Journal*: ROBINSON, A. L.: Exophthalmic goitre, *J. Am. M. Ass.*, 1919, 72: 1327. The black face type (72:) stands for the volume. In a typewritten manuscript the volume number should be underlined.

In the case of a book: KLEIN: Micro-organisms of Disease, Macmillan, London, 1st ed., 1896, p. 151.

Bibliographies are tending to become so cumbersome that frequently the *Journal* has to omit them for lack of space. Contributors are asked to give only the most important references.

ILLUSTRATIONS: Will be paid for by us when satisfactory photographs or drawings are supplied by the author. Negatives are not acceptable. Each illustration, table, etc., should bear the author's name on the back. Photographs should be clear and distinct, preferably black and on glazed paper; drawings should be made in india ink on white paper. For illustrations requiring cuts the best copper plate is used and all are printed on glazed paper. The *Journal* reserves the right to limit the number of illustrations. Contributors are respectfully requested to limit illustrations to such as are absolutely necessary.

REPRINTS: These may be ordered by contributors from the printers upon the form submitted with the galley proof.

ADVERTISEMENTS

First advertising forms go to press thirty days in advance of the date of issue. In forwarding copy, time must be allowed for setting up and submitting proof. Advertising rates on request.

N.B.—We endeavour to exclude from our columns all unethical advertisements and appreciate notification from our readers relative to any misrepresentation.

CLASSIFIED ADVERTISEMENTS are payable in advance. To avoid delay in publishing, remit with order. Advertisements under the following headings cost \$2.00 for each insertion of 40 words or less, additional words 5 cents each.

WANTED: Apparatus, Assistant, Books, Location, Partner, Partnership, Situation.

FOR SALE: Apparatus, Practice, Sanitaria, Drug Stores.

*The Smoke of the
British Empire*

CONRAD VEIDT, in spite of his monocled stare, is said to possess the most magnetic eyes of any man on the screen — which perhaps explains why this Gaumont-British Pictures' star is the idol of women all over the world!

Whenever he can, Mr. Veidt indulges a desire to loaf and smoke—to "laze about", as he puts it — preferably in old and comfortable clothes as you see him here. On or off the set his choice in cigarettes is always the same — W. D. & H. O. Wills' Gold Flakes.

W. D. & H. O. WILLS'

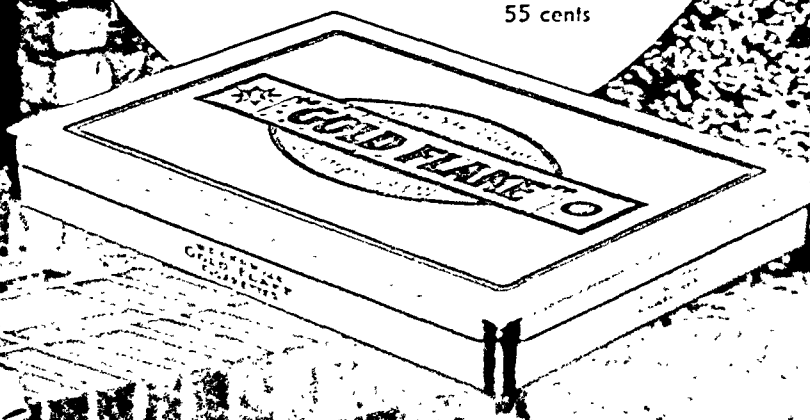
GOLD FLAKE

CORK TIP OR PLAIN

CIGARETTES

A shilling in London — a quarter here

Pocket tin of fifty
55 cents



Conrad Veidt will shortly appear in two new Gaumont-British pictures — "The Passing of the Third Floor Back" and "King of the Damned". Be sure to see them when they come to your theatre.

Good night, my dear

W. D. & H. O. Wills, Ltd., Bristol & London

The Canadian Medical Association

Affiliated with the British Medical Association

President—J. C. MEAKINS, Montreal.

President-Elect—H. M. ROBERTSON, Victoria.

Chairman of Council—G. S. YOUNG, Toronto.

Honorary Treasurer—F. S. PATCH

Editor—A. G. NICHOLLS

3640 University Street, Montreal.

General Secretary—T. C. ROUTLEY, 184 College Street, Toronto.

Associate Secretaries—G. HARVEY AGNEW, Toronto; A. GRANT FLEMING, Montreal.

THE GENERAL COUNCIL

G. S. YOUNG, Toronto, *Chairman*

J. D. Adamson, Winnipeg	J. T. Fotheringham, Toronto	D. C. Malcolm, Saint John	J. F. McNeill, Summerside
G. A. B. Addy, Saint John	W. W. Francis, Montreal	J. K. Malloy, Cardston	W. D. McPhail, Kindersley
G. Harvey Agnew, Toronto	John Fraser, Montreal	C. F. Martin, Montreal	J. A. McPhee, Summerside
A. E. Archer, Lamont	W. E. Gallie, Toronto	A. T. Mathers, Winnipeg	F. C. Neal, Peterborough
J. Fenton Argue, Ottawa	Léon Gérin-Lajoie, Montreal	J. C. Meakins, Montreal	A. G. Nicholls, Montreal
J. M. Barry, Saint John	H. A. Gibson, Calgary	A. H. Meneely, Coronation	J. R. Nugent, Saint John
Gordon Bates, Toronto	J. C. Gillie, Fort William	H. H. Milburn, Vancouver	F. S. Patch, Montreal
A. T. Bazin, Montreal	Duncan Graham, Toronto	D. P. Miller, Prince Albert	G. R. Peterson, Saskatoon
C. H. Best, Toronto	Roscoe R. Graham, Toronto	Ross Millar, Ottawa	Paul Poirier, Montreal
V. E. Black, Moose Jaw	H. G. Grant, Halifax	W. T. B. Mitchell, Montreal	A. Primrose, Toronto
Jas. E. Bloomer, Moose Jaw	S. E. Grondin, Quebec	E. W. Montgomery, Winnipeg	C. W. Prowd, Vancouver
Wesley Bourne, Montreal	John Gunn, Calgary	W. L. Muir, Halifax	George A. Ramsay, London
William Boyd, Winnipeg	W. Hackney, Calgary	A. R. Munroe, Edmonton	J. W. Richardson, Calgary
Alan Brown, Toronto	R. H. M. Hardisty, Montreal	G. H. Murphy, Halifax	G. W. Rogers, Dauphin
J. F. Burgess, Montreal	N. MacL. Harris, Ottawa	H. H. Murphy, Victoria	F. W. Routley, Toronto
W. G. M. Byers, Montreal	R. I. Harris, Toronto	Daniel Murray, Tatamagouche	T. C. Routley, Toronto
G. Stewart Cameron,	A. K. Haywood, Vancouver	E. R. Myers, Saskatoon	E. Stanley Ryerson, Toronto
Peterborough	J. J. Heagerty, Ottawa	H. E. MacDermot, Montreal	H. B. Small, Ottawa
J. A. Couillard, Lake Edward	V. E. Henderson, Toronto	J. S. McEachern, Calgary	W. Harvey Smith, Winnipeg
L. L. Charpentier,	W. B. Hendry, Toronto	A. J. McGanity, Kitchener	Howard Spohn, Vancouver
Drummondville	C. M. Hincks, Toronto	J. K. McGregor, Hamilton	G. D. Stanley, Calgary
H. H. Chown, Winnipeg	C. P. Howard, Montreal	R. E. McKechnie, Vancouver	Jas. Stevenson, Quebec
H. H. Christie, Esterhazy	F. W. Jackson, Winnipeg	S. H. McKee, Montreal	J. A. Stewart, Victoria
J. T. Clarke, Ottawa	W. A. Jones, Kingston	D. W. MacKenzie, Montreal	G. F. Strong, Vancouver
W. V. Cone, Montreal	G. R. Johnson, Calgary	J. W. MacKenzie, Charlottetown	F. F. Tisdall, Toronto
A. R. Cunningham, Halifax	A. Stanley Kirkland, Saint John	K. A. MacKenzie, Halifax	Ethlyn Trapp, Vancouver
P. C. Dagneau, Quebec	W. J. Knox, Kelowna	Murray MacLaren, Saint John	E. Trottier, Montreal
W. H. Delaney, Quebec	A. S. Lamb, Vancouver	Hugh MacLean, Regina	G. C. VanWart, Fredericton
C. E. A. DeWitt, Wolfville	A. D. Lapp, Vancouver	W. J. P. MacMillan,	C. J. Veniot, Bathurst
R. W. L. Earle, Perth, N.B.	Forrest Leader, Victoria	Charlottetown	G. J. Wherrett, Ottawa
J. G. FitzGerald, Toronto	A. LeSage, Montreal	Helen MacMurchy, Toronto	Ward Woolner, Ayr
A. Grant Fleming, Montreal	D. Sclater Lewis, Montreal	D. S. Macnab, Calgary	C. F. Wyld, Montreal
	David Low, Regina	W. J. McNally, Montreal	A. MacG. Young, Saskatoon
		D. McNeil, Glace Bay	

EXECUTIVE COUNCIL

George S. Young, Toronto	J. G. FitzGerald, Toronto	J. S. McEachern, Calgary	A. G. Nicholls, Montreal
<i>Chairman</i>	Léon Gérin-Lajoie, Montreal	K. A. McKenzie, Halifax	F. S. Patch, Montreal
A. T. Bazin, Montreal	Duncan Graham, Toronto	J. C. Meakins, Montreal	A. Primrose, Toronto
J. E. Bloomer, Moose Jaw, Sask.	A. S. Kirkland, Saint John, N.B.	E. S. Moorhead, Winnipeg	H. M. Robertson, Victoria, B.C.
			T. C. Routley, Toronto

For names of Sectional Officers, Standing Committees, and Officers of Provincial Medical Associations see alternate issues.

For Control of Pain and Cough—

Dipaudia
dihydromorphinone hydrochloride

COUNCIL
ACCEPTED

A powerful analgesic with several advantages over morphine. Acts quicker and causes fewer undesirable side-effects. A dose of 1/20 grain will generally take the place of 1/4 grain morphine. Dose: for pain 1/32 to 1/16 grain; for cough, 1/96 to 1/24 grain.

Literature upon request from

MERCK & CO. Ltd., 412 St. Sulpice St., MONTREAL - Selling Agents

Manufacturers: Bilhuber-Knoll Corp., Jersey City, N.J.

MARMITE

(Registered Trade Mark)

A USEFUL WEAPON IN COMBATING INFLUENZA

When colds, influenza and other winter illnesses are prevalent, the regular daily administration of MARMITE is advised by physicians, for it has proved a useful aid in combating such complaints.

It is realized that Vitamin B deficiency tends to lower resistance to infection, and that MARMITE supplies both Vitamin B₁ and B₂ in adequate amount and in palatable form.

MARMITE is a yeast extract that also provides a valuable hæmopoietic factor which is not one of the known B vitamins; it is prescribed widely in certain anæmias.

As a hot drink made with boiling water or milk MARMITE is appreciated by people of all ages.

It is found to be of special value for inclusion in the diets of invalids and children, but it is almost equally valuable for use in any home, office, school or institution where attention is given to the maintenance of health.



For sample and literature write

THE MARMITE FOOD EXTRACT CO., LTD.

Walsingham House, Seething Lane, London, E.C. 3.

or to

MacLAREN-WRIGHT, LTD.

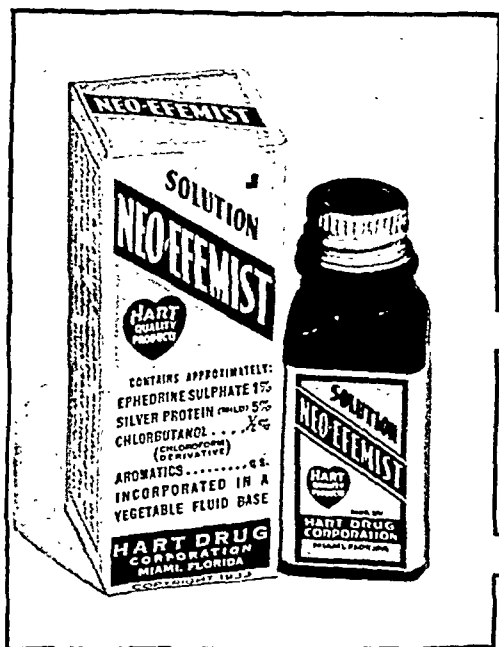
-

69 Front Street East, Toronto

Canadian Distributors

Packed in jars—2 oz., 4 oz., 8 oz. and 7 lb. tins.

Special quotations for supplies in bulk to Hospitals and Institutions.



New!

A Silver Containing Ephedrine Solution:

R *Sol. Neo-Efemist 15* CC.
(Hart)

DEAR DOCTOR:

At this season of the year sore throats and colds-in-the-head increasingly demand your services. We respectfully direct your attention to NEO-EFEMIST (Hart), a really meritorious therapeutic agent for the localized treatment of these conditions.

The Silver Protein Mild, U.S.P., which this preparation contains has withstood the test of time against all newcomers as a superior agent for mucous membrane antisepsis.

The vasoconstrictor and decongestive action of the ephedrine sulphate contained in NEO-EFEMIST not only prevents undesirable diffusion of its contained silver, but also lessens systemic toxic absorption by greatly lowering permeability of the mucous membrane. Indeed, the early application of this preparation often succeeds in promptly checking the systemic symptoms of colds-in-the-head and sore throats.

If you have not already tried NEO-EFEMIST (Hart), send the coupon below to our Canadian representative for a complimentary bottle.

HART DRUG CORPORATION

LAURENTIAN LABORATORIES LIMITED,
560 De Courcelles Street,
St. Henry, Montreal.

Please send me complimentary bottle of NEO-EFEMIST (Hart) for clinical trial.

M.D.

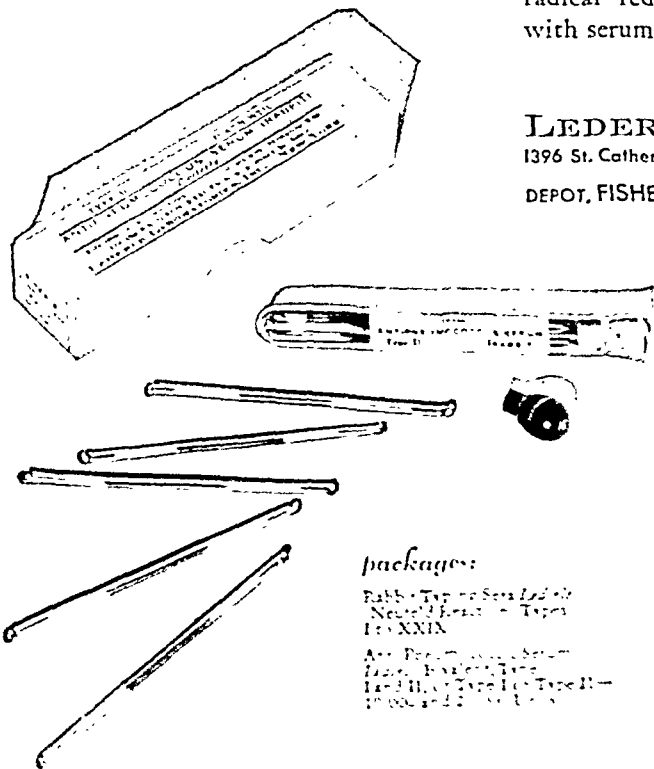
Pneumonia Typing is Simple!

DIAGNOSIS—pneumonia! Pneumococcus pneumonia? Is serum therapy indicated? That depends on the type of the causative pneumococcus.

The physician calls for Rapid Typing sera *Lederle*, Types I and II, the types for which "Council-Accepted" therapeutic sera are available. Microscopic examination of a fleck of the patient's sputum mixed with the required amount of specific typing sera, reveals typical changes in the capsule—Neufeld reaction—in the mixture that identifies the type. These changes consist of a swelling of the capsule with a sharp definition of outline.

All in a few minutes! And therapeutic serum administration may be begun at once. Pictures of the significant capsular swelling are in the direction sheets in the *Lederle* packages. (If no such capsules are found, the efforts to identify the type can be carried further. *Lederle* has Typing sera for 29 types of pneumonia but full use of the series is usually regarded as requiring special technical training.)

Early administration is essential to secure the radical reductions of average mortality obtainable with serum therapy.



packages:

Rapid Typing Sera *Lederle*
Neufeld Reaction — Types
I & XXIX

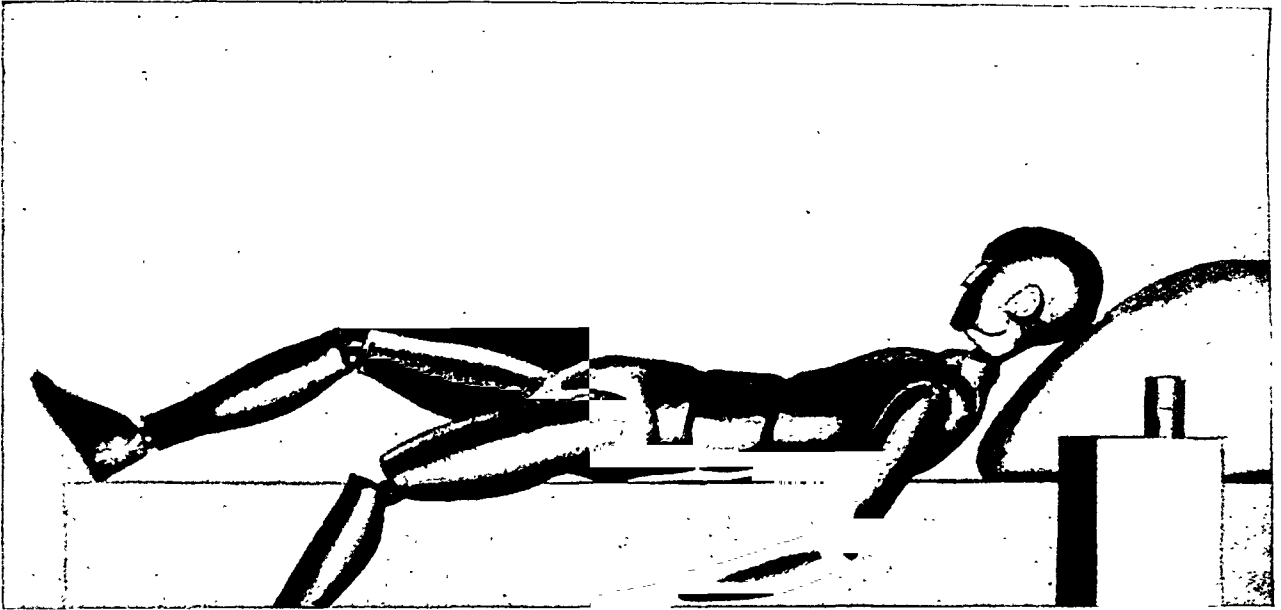
Anti-Pneumococcus Serum
Types I & XXIX
1 cc. (0.33 fl. oz.) each
10 cc. (0.33 fl. oz.) each

LEDERLE LABORATORIES, INC.

1396 St. Catherine Street, West

Montreal, Quebec

DEPOT, FISHER & BURPE, 219 Kennedy Street, Winnipeg, Manitoba



Controlling discomfort **in COLDS and INFLUENZA**

To allay the headache, backache and general soreness associated with coryza, pharyngitis and tonsillitis, many physicians depend upon Gardan.

Experience has demonstrated that Gardan affords prompt relief without depressing the heart and respiration. By reducing the fever, it also makes the patient more comfortable. Its effect usually extends over many hours.

DOSE: For adults, 1 tablet or 2 teaspoonfuls of Elixir. These doses may be doubled for severe pain. Children 5 years old, $\frac{1}{2}$ tablet or 1 teaspoonful of Elixir.

HOW SUPPLIED: Gardan is supplied in $7\frac{1}{2}$ grain tablets, tubes of 10, and bottles of 25 and 100. Also Elixir of Gardan (3 grains per teaspoonful) bottles of 4 oz.

GARDAN

Trademark Reg. In Canada

Detailed literature on request

WINTHROP CHEMICAL COMPANY, INC.

Pharmaceuticals of merit for the physician

Office and factory: Windsor, Ontario

WINTHRO

A Wide Range of Laxative Potency

There is a Petrolagar type to meet practically every requirement of successful bowel management.



HERE THEY ARE:

1. Petrolagar—Plain.

A palatable emulsion of liquid petrolatum (65% by volume) and agar-agar. A rational corrective agent in the treatment of constipation.

2. Petrolagar with Phenolphthalein.

For obstinate cases of constipation. Contains $\frac{2}{3}$ grain of phenolphthalein to the tablespoon.

3. Petrolagar with Milk of Magnesia.

For constipation accompanied by hyperacidity. Slightly more active than Petrolagar—Plain. Contains 8% Milk of Magnesia.

4. Petrolagar—Unsweetened.

For those who prefer unsweetened Petrolagar or for the patient with diabetic tendencies. Contains no sugar or assimilable carbohydrates.

5. Petrolagar with Cascara.

Indicated for the promotion of peristalsis and proper fecal consistency. More active than Petrolagar—Plain. Contains 13.2% non-bitter fluid extract cascara sagrada.

Samples free on request

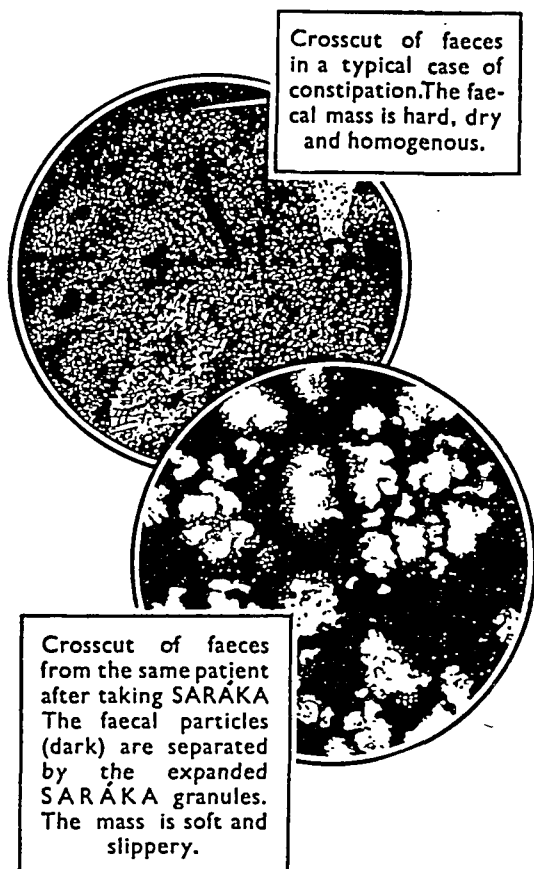
PETROLAGAR LABORATORIES OF CANADA, LTD.

364 Argyle Road - WALKERVILLE, ONTARIO

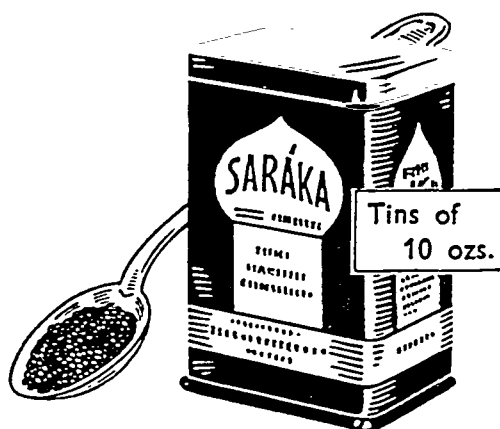
Normal intestinal function through **SARÁKA**

Free from the inconveniences
of paraffin preparations

Chronic Constipation

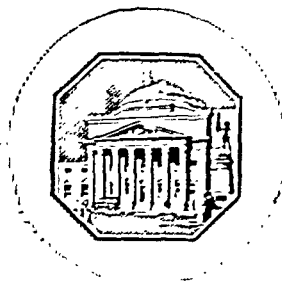


is mostly caused by modern foods being too concentrated, thus lacking the residue necessary to stimulate normal evacuation. The creation of SARÁKA is based on the recognition of this fact. SARÁKA consists of coated granules of an indian mucilage, which in the alkaline medium of the intestine acquire a greater volume and gelatinous consistency. In mixing with the faeces they soften them thus giving greater bulk thereby inducing normal and easy defaction.



SCHERING (CANADA) LTD.

P.O. BOX 358 - MONTREAL



Trusted custodian of the
savings of Canadians for generations.

BANK OF MONTREAL

Established 1817

TOTAL ASSETS IN EXCESS OF \$750,000,000

A MILLION DEPOSIT ACCOUNTS DENOTE CONFIDENCE

Relieve Bronchial Irritation

&

MISTURA TUSSI

Hartz

FORMULA

Each fluid ounce represents	
Ammonium Carbonate	10 grains
Ammonium Chloride	10 grains
Marrubium vulgare	25 grains
Diamorphine Hydrochloride	1.6 gram
Syrup Tolu	120 minims
Syrup Squill	120 minims

DOSE: One-half to two fluid
drachms as may be indicated

MISTURA TUSSI, *Hartz*, is a palatable, stimulating expectorant which quickly and effectively relieves bronchial irritation, without locking up the secretions. Its sedative action renders it particularly valuable in hard, dry coughs where expectoration is scanty.

A Canadian Product from the Laboratories of

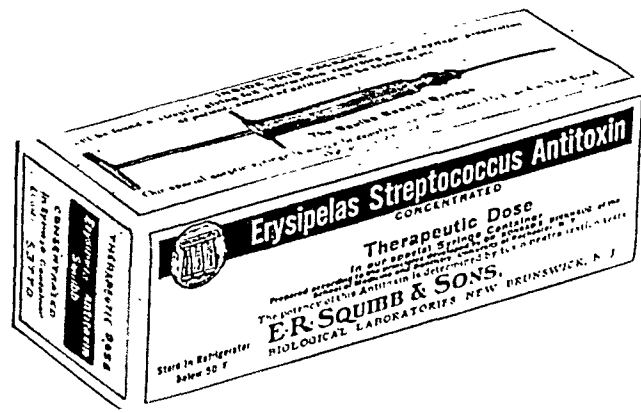
The J. F. HARTZ CO. LIMITED

Physicians' Supplies

TORONTO

∴

MONTREAL



HIGHLY PURIFIED and CONCENTRATED
WHEN given early and in adequate dosage Erysipelas Streptococcus Antitoxin Squibb acts promptly in checking the spread of the lesion and alleviating symptoms.



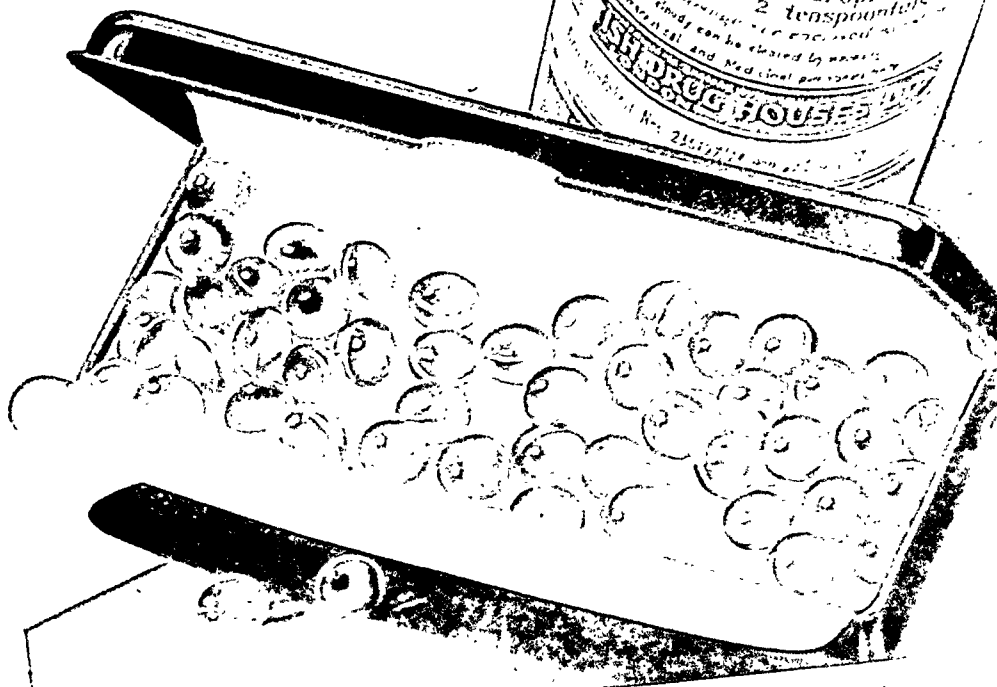
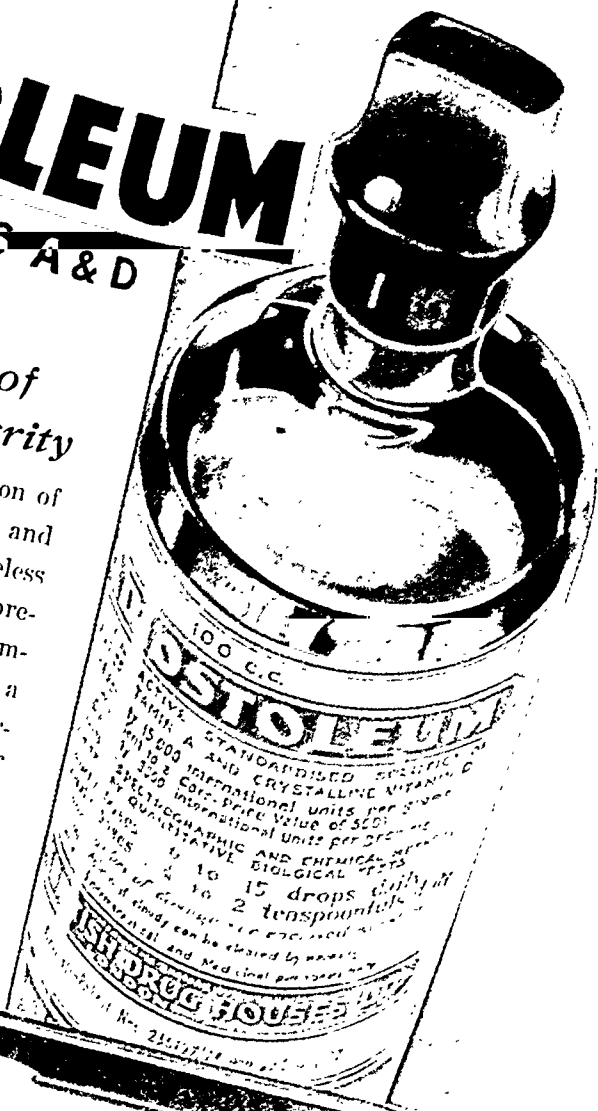
Other Squibb Biologicals — DIPHTHERIA PRODUCTS
TETANUS ANTITOXIN . . SCARLET FEVER PRODUCTS
. . TYPHOID VACCINES . . SMALLPOX VACCINE . .

RADIOSTOLEUM

STANDARDISED VITAMINS A & D

For the maintenance of Epithelial Integrity

Radiostoleum is a highly active solution of purified and standardised Vitamin A and pure crystalline Vitamin D in a tasteless oil. The Vitamin A in Radiostoleum preserves the integrity of the mucous membranes lining the body, thus providing a defence against attacks of invading organisms. The collateral administration of Vitamin D with Vitamin A intensifies the effect of the latter and, at the same time, counteracts any deficiencies of the calcifying vitamin.

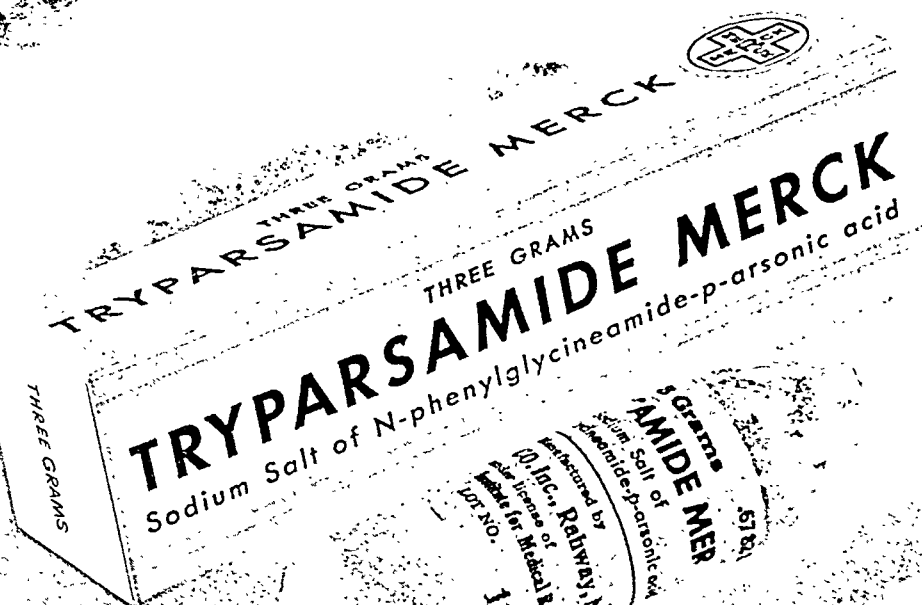


Stocks are held by leading druggists throughout the Dominion, and full particulars are available from

THE BRITISH DRUG HOUSES (CANADA) LTD.
Terminal Warehouse
Toronto 2, Ont.

TRYP

Sodium salt



Tryparsamide Merck has an unusual power of therapeutic penetration, especially in reference to the central nervous system. It is this property that has resulted in its use, and subsequent development as the chemotherapeutic agent of choice, for the treatment of neurosyphilis.

Clinical reports indicate that forty to fifty per cent of cases of early paresis show symptomatic improvement under treatment with Tryparsamide Merck. In the menin-

Neurosyphilis

geal type of neurosyphilis Tryparsamide Merck acts almost, if not entirely, as a specific drug. Clinical improve-

ment is usually very prompt and serological cure usually occurs within the first year.

Tryparsamide Merck is administered intravenously. The treatment is inexpensive, does not disrupt the patient's daily routine of life, and is available through the services of his personal physician.

CLINICAL REPORTS AND TREATMENT METHODS WILL BE FURNISHED ON REQUEST

MERCK & CO. Ltd.

Manufacturing Chemists

MONTREAL, QUE.

Hypotensyl

*For relief of High
Blood Pressure*

ANGLO-FRENCH DRUG CO.

354 St. Catherine Street East
MONTREAL

SAMPLES AND LITERATURE ON REQUEST



A word

FOR THE PATIENT WHO DOESN'T SAY A WORD FOR HERSELF

(even when cod liver oil is prescribed)

Abbott's Haliver Oil with Viosterol is a neat solution to the problem of the patient who refuses to take cod liver oil. But what about those all too few (and thrice blessed) patients who wouldn't think of questioning their physician's instructions? Even when cod liver oil is prescribed! Wouldn't the adults who still take cod liver oil, because they've been told to do so, appreciate the advantages of Abbott's Haliver Oil with Viosterol? Here's a product so patent that one 3-minim capsule, or ten drops, supplies at least as much Vitamin A as *four* teaspoon-

fuls of cod liver oil*, and as much Vitamin D as 4 drops of Viosterol in Oil. The small dosage required with Haliver Oil with Viosterol entirely eliminates the difficulty of administration as well as the nausea and gastric distress which often result from patients taking cod liver oil. Make Abbott's Haliver Oil with Viosterol available to every patient needing additional supplies of Vitamins A and D. It is available everywhere and is sold on prescription at reasonable cost. Supplied in boxes of 25 and 50 soft, elastic capsules; and in 5-cc. and 50-cc. bottles.

*U. S. P. X, Revised 1934, 600 A units per gram.

ABBOTT LABORATORIES LTD.,
388 St. Paul St. West, Montreal

Send physician's FREE samples of Abbott's Haliver Oil with Viosterol to

M.D.

Address

ABBOTT'S HALIVER OIL

with Viosterol

for Every Patient

The Canadian Medical Association Journal

Vol. 34

TORONTO, FEBRUARY, 1936

No. 2

SILICON AND DUST DEPOSITS IN THE TISSUES OF PERSONS WITHOUT OCCUPATIONAL EXPOSURE TO SILICEOUS DUSTS

By T. H. BELT,

of the Department of Pathology,

D. IRWIN AND E. J. KING,

*of the Department of Medical Research, Banting Institute, University of Toronto,
Toronto*

THE diagnosis of silicosis is often satisfactorily made during life by analysis of the occupational history, physical findings, and roentgenograms. After death there are fairly definite pathological criteria by which to establish the presence or absence of the disease. The pathologists of the South African mining area, who perhaps have had the widest experience of its morbid anatomy, are able to give a definite opinion as to the degree of silicosis, in most cases, from the appearance of the macroscopic specimen alone.¹ In other countries, where perhaps the majority of cases are not as clear-cut as in Africa, it is customary to call upon such confirmatory evidence as may be obtainable from laboratory investigations of the suspected lung tissue. Histological examination is of considerable assistance, but not always far-reaching enough to clinch the diagnosis. Fibrosis is, of course, the chief reaction to be observed in the silicotic lung, but fibrosis, like inflammation, is one of the most non-specific reactions and may be produced in the lung by many different agencies. Even when the fibrosis conforms to the typical nodular form (silicotic nodules) Kettle and Archer² have shown that it may be histologically indistinguishable from healed, fibroid tuberculosis. Thus, when the ordinary means at the pathologist's disposal fail to make the necessary distinction recourse is had to chemical analysis of the suspected tissue. Part or parts of the lung are set aside for chemical assay.

The "silica content" of the normal lung has been worked out by King³ and others^{4,5} at 14 to 200 mg. per cent of the dried tissue. When the percentage rises above 500 mg. per cent in the presence of visible and palpable fibrosis most authorities regard it as positive evidence of silicosis. Sladden⁴ goes so far as to say: "When the silica content of the lungs determined chemically exceeds 1.0 per cent (1,000 mg. per cent) of the dried lung substance there is fibrosis of an important extent, clearly contributory towards death. When the silica content exceeds 1.6 per cent, the fibrosis is, with practically no exceptions, very severe and sufficient in itself to lead to death". Hackmann⁵ regards 1.0 per cent of silica in the dried lung as sufficient to produce extensive lesions. Stewart and Faulds⁶ look upon a silica content of more than 1.0 per cent (dry weight of lung) as accountable for the fibrosis which they found in the lungs of hematite miners. McNally⁷ says: "Any lung containing over 2 mg. of silica per gram of dried tissue indicates undue exposure to a dusty atmosphere". Kussmaul⁸ (1866) gave somewhat higher figures for the silica content of normal lungs (4.22 per cent to 17.3 per cent of the ash, or 240 to 480 mg. per cent of the dry weight), but his results were probably due to the fact that he assayed the entire lung in each case, including root glands, whereas other investigators have made their determinations on small portions of tissue. In Fowweather's⁹ cases of actual silicosis the silica content of the lungs went as high as 4.18 per cent of the dry weight.

In arriving at a diagnosis in questionable cases considerable significance is likely to be attached to the result of the chemical assay. When the chemist reports an abnormally high 'silica' content of a fibrosed lung it may seem at first sight a good and sufficient reason for regarding the case as one of silicosis. Yet there are certain qualifications which must be taken into account before accepting the 'silica' content as a criterion of diagnosis. Not everyone understands that up to the present no satisfactory means has been

described for the quantitative estimation of silica (SiO_2), as distinct from silicates in tissue specimens.* The chemist can merely determine the amount of the element silicon. Neither gravimetric nor colorimetric procedures will distinguish between the silicon in silica and silicate. The conventional method of expressing the result as "total silica" is therefore somewhat misleading, for it does not necessarily indicate that all or any of the silicon present was actually in the form of SiO_2 . Since there is evidence of a considerable variation in the pathogenicity of the various compounds of silicon, as shown by the work of Kettle,¹⁰ Gardner,¹¹ Miller and Sayers¹² and others, the chemical assay does not accurately assess the disease-producing quality of the siliceous material present in a given specimen.

It occurred to us, therefore, that some of the more innocuous compounds of silicon might be reckoned unwittingly in the chemist's assay as part of the "total silica" in suspected cases. Might there not be certain endogenous organic silicates taking part in the formation of animal tissues, as in the case of plants? Is it possible, for example, that the process of fibrosis *per se* might increase the silicon content of tissue? The work of Schulz,¹³ which, to our knowledge has never been confirmed or refuted, suggests this possibility. Schulz claimed that connective tissue (of infants especially) contained more silicon than other tissues of the body, his figures running as high as 581 mg. per cent of dry weight for the lens of the eye. A further possibility of error has to be ruled out in the case of tuberculous patients. Kraut¹⁴ believed that he had shown an increase of silicon in the blood of consumptives, and McNally⁷ suggests that part of the "silica" found in the lungs of tuberculo-silicotics may be endogenous.

We therefore determined to select a wide range of human tissues, both normal and pathological, from cases in which there was no special dust exposure, for the purpose of establishing the normal silicon content. We wished to compare inflamed with non-inflamed tissues, tuberculous with non-tuberculous lesions, scarred areas of

lung with normal, air-containing parts, tendons and other tough connective-tissue structures with glands, muscle and the softer parts of the body. Accordingly, six autopsy cases were chosen, the persons in question ranging in age from 2 months to 74 years. Blocks of tissue weighing roughly from 0.5 to 2 grams were taken, each block was divided in two, one-half of each parcelled in wax paper and set aside for chemical determination of total silica by the micro-method previously described.^{15*} The other half was fixed in formalin for histological examination and micro-incineration. For the latter procedure, which has been described in detail elsewhere,¹⁶ three serial sections were cut from each paraffin block. The first section was incinerated to demonstrate the total inorganic material present; the second was stained in the usual way with hæmatoxylin and eosin; and the third was incinerated and then treated with concentrated hydrochloric acid to remove the non-siliceous material. In this manner it was possible to study the distribution as well as the morphology of the siliceous residue in each specimen submitted to chemical assay.

With the understanding that we do not know in what form the silicon exists, whether as the dioxide or organic or inorganic compounds, we shall hereafter in this article express the result of the chemical assay in milligrams per cent of equivalent 'silica' per 100 grams of dried tissue. Though we have criticized this practice above, on the grounds that it is misleading to the lay-chemist, yet having made clear the fallacy of it we continue its usage for the sake of employing the same yard-stick, so to speak, with which others have measured the silicon content of tissues.

The following observations are drawn from Table I. With the exception of the lung and tracheo-bronchial lymph glands the majority of tissues, regardless of the age of the individual, contain less than 50 mg. per cent 'silica'.

Sections of these tissues (other than lung and tracheo-bronchial glands) submitted to the process of micro-incineration showed only traces of

* Since the completion of this communication a method of quantitatively estimating the amount of quartz present in a dust by means of an x-ray diffraction method has been suggested by Prof. T. L. Walker and worked out by Clark and Reynolds, which should prove to be of great value to those interested in silicosis. (University of Toronto Studies, Geological Series No. 38, 1935).

* Sodium silicofluoride, a light, anhydrous, non-hygroscopic powder which hydrolyzes in solution to give silicic acid, was found to be a more satisfactory standard than the potassium silicate previously used. A solution containing 15.7 mg. of sodium silicofluoride in 500 c.c. of water gives a concentration equivalent to 0.10 mg. of SiO_2 in 10 c.c. A fresh standard should be prepared weekly.

TABLE I.
CONTENT OF TOTAL SILICEOUS MATERIAL IN HUMAN TISSUES
Expressed as Milligrams of SiO_2 per 100 grams of Dried Tissue

Autopsy Number.....	A-253-34 F 2 months	A-253-33 F 7 years	A-331-33 F 25 years Housewife	A-400-33 F 54 years Housewife Asthma Pneumonia	A-308-33 M 65 years Boilermaker Prostatectomy Lobar pneumonia	A-318-33 M 74 years Janitor Prostatectomy Pneumonia
Skin—Of Scalp.....	248½	51	270	41	66	35
Of Abdomen.....	139½	39	256	65	44	41
Sole of Foot.....	83		130			
	35	59	133	11	58	19
Bone—Compact.....	..	21	19	11	25	..
Cancellous.....	..	12	20	14	40	..
Cartilage—Costal.....	..	35	34	16	33	29
Brain—Dura Mater....	..	21	17	11	22	37
Cerebral Cortex.....	36	..	13	14	21	12
Pons.....	43	..	13	14	16	13
Pineal Body.....	..	..	..	70	95	18
Spinal Cord.....	..	13	16	18	87	83
Nerve, Peripheral.....	..	14	22	11	40	22
Gland—Pituitary.....	..	..	..	27	31	14
Thyroid.....	..	55	..	..	..	67
Parathyroid.....	..	46	21	13	20	25
Muscle—Pectoral.....	102*	33	15	20	30	23
Diaphragm.....	..	44	..	..	..	16
Tendon Achilles.....	..	51	13	11	27	15
Lung.....	24	..	..	12	..	16
	14	47	129	268*	41**	275***
					209	229†
Lymphatic Gland Peri-Bronchial.....	27	186	3,410	615½† 1,066‡	1,049	2,283
Mesenteric.....	340½	44	..	22	534½	16
Heart—Myocardium....	16	15	12	11	29	13
Endocardium.....	..	..	..	14	28	..
Aorta Thoracic.....	20	14	18	19	24	34
Artery Iliac.....	..	41	51	42	28	14
Vein Inferior Vena Cava.....	..	..	94	79	48	7
Liver.....	12	11	16	17	13	17
Spleen.....	15	23	41	28	27	21
Pancreas.....	145½	16	31	16	23	20
Adrenal.....	80	14	..	..	..	..
Kidney.....	22	25	25	14	34	35
Bladder.....	17	19	11	10	27	9
Prostate.....	..	21	19	7	..	..
Testes.....	..	..	..	..	..	11
Uterus.....	11	12	7	..	20	8
Ovary.....	..	10	11	21	..	..
Esophagus.....	..	..	18	15	26	..
Stomach.....	22	12	17	23	12	12
Duodenum.....	17	13	10	17	17	..
Caecum.....	..	27	20	..	..	..
Rectum.....	74	25	17	15	25	10
Other Normal Tissues.....	Thymus 81 Cerebellum 16 Rib 21 Spleen 17 Psoas Muscle 23 Brain 47	Gall bladder 31 Appendix 68	Mammary Gland 12	Cervix 11 Vagina 12	..	..

Pathological Tissues

Fig. 1. Silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

Fig. 2. Silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

Fig. 3. Silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

Fig. 4. Silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

Fig. 5. Silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

Fig. 6. Silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

Fig. 7. Silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

Fig. 8. Silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

Fig. 9. Silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

Fig. 10. Silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

*The values of the total silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

**The values of the total silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

***The values of the total silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

1. The values of the total silica dust deposits in the lungs of a patient with silicosis. (H. & E., ×100.)

HCl-insoluble residue. This residue was in the form of very finely granular, colourless, amorphous, isotropic material. In certain tissues, as, for example, the spinal cord of A-303-33, it formed a very thin, diffuse film; in others it was quite uneven and bore no characteristic relationship to any tissue element. Only in the rectum was there a distinctive distribution, and here the residue was confined to the tunica propria. Small as this residue was, it seemed in every case to vary directly in amount as the chemical assay. It probably represented the remains of an organic silicon compound inherent in the tissues.

Certain of the skin specimens contained considerably more than 50 mg. per cent 'silica' on repeated assays. Micro-incineration of these tissues showed a thin layer of siliceous particles along the skin surface or imbedded in the keratin layer. This material was doubly refractive, and some of the particles possessed the laminated structure of talc (magnesium silicate). The high 'silica' content of these specimens was therefore in the nature of an artefact, due to the presence of siliceous dirt particles and talcum powder.

In Case 1 of the series (a 2 months old infant) several of the tissues exceeded 100 mg. per cent 'silica', the highest being 340 in a mesenteric lymph node. No re-check of this assay was possible. Micro-incineration in this case showed only minute traces of siliceous material through the tissues, comparable in amount to that of other specimens whose assay ran lower than 50 mg. per cent 'silica', but on the edges of the sections were numerous large, laminated HCl-insoluble crystals, again resembling talc. This finding bore out the suspicion that the high assay figures in this case were due to the presence of talcum powder, probably transferred to the specimens from the pathologist's gloves. In subsequent cases care was taken to avoid contamination of the tissues by talcum powder.

Tough connective-tissue structures contain no more 'silica' on the average than other tissues. (Schulz¹³ to the contrary; see above).

The process of inflammation does not increase the 'silica' content of tissues.

The lung specimens showed percentages of 'silica' comparable to, but slightly higher than, those reported by other investigators. Of greater

interest, however, than the average assay figure was the variation in 'silica' content from one part of the lung to another. In Case 5, Table I, for example, a scarred portion of the apex, deeply coloured with anthracotic pigment, contained 209 mg. per cent 'silica', while a second block of pale, feathery tissue from another part of the same lung contained only 41 mg. per cent. Though little significance could be attached to this single observation, it pointed the way to further investigations subsequently undertaken. A detailed consideration of the lung findings will be found in the discussion of the larger series of cases to follow.

The 'silica' values for the tracheo-bronchial lymphatic glands of the adult individuals were surprisingly high, ranging from 615 to 3,410 mg. per cent. Though these results were similar to those published by Woskressensky¹⁷ in 1898, both his and our own work stood in need of further corroboration and more intensive study. Accordingly, before attempting to draw conclusions from this small number of cases, a further series of analyses was carried out.

Nineteen autopsy cases were selected, including 11 males and 8 females, covering a wide range of occupations as well as ages. In each case the following procedure was adopted. All the tracheo-bronchial glands were carefully dissected out, examined minutely, sectioned, recorded and divided into groups according to the degree of anthracotic pigmentation or pathological alteration. Glands containing old tuberculous lesions were segregated and analyzed separately. If, as occasionally happened, the tracheobronchial glands of an individual were all more or less uniformly pigmented and showed no lesions, only one analysis was done on the lot. In a few instances abdominal lymph glands, among them two calcified tuberculous mesenteric nodes, were studied for comparison. In each case a representative block of lung tissue weighing about 10 grams was selected from a peripheral part of one or other lung which showed a degree of anthracotic pigmentation judged to be average for both lungs as a whole. Each block was cut so that it had pleura on approximately one-quarter of its surface. Except where otherwise specified in Table II, these "representative" blocks were taken from normal, air-containing lung. In addition, a second or third block was sometimes taken from pathological

TABLE II.

No.	Autopsy Number	Sex	Age	Occupation	Cause of Death	Milligrams of Siliceous Material per 100 grams of dried tissue				Remarks		
						Lung		Tracheobronchial Lymph Glands				
						Representative areas	Selected areas	Glands with deepest anthracotic pigmentation	Other glands	Degree of anthracotic pigmentation	Pathological changes	Description of extra lung blocks
1	A-13-34 H.S.C.	M	13	School boy	Chronic osteomyelitis, septicæmia	49	167	150	...	Lung— Non visible Glands—Fine stippling		More pleura attached.
2	A-391-33	F	16	Laundry worker	Suicide—Acute phosphorus poisoning	126	...	2196	...	Lung— Very little Glands—Slight stippling		
3	A-347-33	M	31	Butcher	Rheumatic heart disease	48	..	187	...	Lung— Non visible Glands—Moderate flecking	Chronic passive congestion Oedema.	
4	A-386-33	F	32	Housewife	Bright's disease Rupture of aorta	52	...	768	279 586	Lung— None visible Glands—Lot 1—heavy mottling 2—slight stippling 3—black	Chronic passive congestion Old tbc. fibrosis	
5	5-34 (W.H.)	M	37	Painter	General and pulmonary tuberculosis	38	37	49	...	Lung— None visible Glands—None visible	Acute adenitis	Caseous necrosis
6	A-306-33	M	37	Coal miner	Chronic pulmonary tuberculosis	141	522 137	1096	...	Lung— Dirty grey Glands—Moderate mottling		(1) Black rubbery tbc. fibrosis from apex. (2) Pale caseous necrosis
7	A-388-33	M	42	Farmer	Brain tumour	94	...	2305	...	Lung— Slight mottling Glands—Heavy mottling	Oedema	
8	A-24-34	F	45	Housewife	Pulmonary tuberculosis Pulmonary embolism	114	94	858	196	Lung— Slight stippling Glands—Lot 1—Black streaking 2—Dirty grey	Old tbc. calcification and fibrosis	Caseous necrosis
9	A-397-33	M	48	Merchant	Strangulated hernia. Heart disease	143	399	2025	...	Lung— Heavy mottling Glands—Heavy mottling		More pleura attached.
10	A-403-33	F	52	Housewife	Carcinoma of cervix	212	376	...	...	Lung— Heavy mottling		Black rubbery healed infarct
11	A-381-33	M	61	Lumberman	Carcinomatosis	292	244 183	2370	750 88	Lung— Heavy mottling Glands—Lot 1—Black 2—Partly black 3—Nodes (para-aortic)	Old tbc. calcification and fibrosis	(1) Dirty grey hepatization. (2) Cancer metastasis, grey. With-out fibrosis
12	A-392-33	F	64	Housewife	Coronary disease. Generalized arteriosclerosis.	183	...	2605	2336	Lung— Slight mottling Glands—Lot 1—Inky black 2—Heavy mottling		
13	A-394-33	M	66	Car washer	Peritonitis (accident)	264	...	2097	1340	Lung— Slight mottling Glands—Lot 1—Jet black 2—Moderate mottling	Inflammatory consolidation	
14	A-396-33	F	66	Housewife	Lobar pneumonia	119	...	1002	227	Lung— Slight mottling Glands—Lot 1—Black 2—Slight mottling		
15	A-20-34	F	67	Widow	Hydronephrosis. Pneumonia	154	340	...	...	Lung— Slight stippling		Black rubbery tbc. scar of apex.
16	A-385-33	F	67	Housewife	Carcinoma of uterus	289	440	4420	3710	Lung— Slight mottling Glands—Lot 1—Jet black 2—Dirty grey	Cancer metastasis	Dirty grey cancer metastasis. With fibrosis.
17	A-387-33	M	73		Chronic gastric ulcer. Hypertrophy of prostate	230	...	4477	1116 52	Lung— Slight mottling Glands—Lot 1—Jet black 2—Moderate mottling 3—None	Calcified tbc. mesenteric	
18	A-398-33	M	74	Labourer	Generalized arteriosclerosis with gangrene	221	...	4917	632	Lung— Dirty grey Glands—Lot 1—Jet black 2—Half black	Inflammatory consolidation Half calcified tbc.	
19	A-393-33	M	82	Insurance agent	Hypertrophy of prostate with sequelæ	201	...	2295	101	Lung— Heavy mottling Glands—Lot 1—Heavy Mottling 2—None	Calcified tbc. mesenteric	

parts or areas of deeper pigmentation, as indicated in Table II. Each specimen, whether glands or lung tissue, except in certain instances of single glands of small size, was divided so that histological examination and micro-incineration might be carried out on tissues exactly like those submitted to chemical assay.

Micro-incineration of lungs and tracheo-bronchial glands.—Practically without exception the incinerated sections showed HCl-insoluble residues comparable in amount to the results obtained by chemical assay. In fact, after examining a large number of sections, it was possible by the appearance of the incinerated residue to foretell the chemical assay within 200 to 300 mg. per cent.

By comparison with the stained paraffin sections, whether of lung or glands, the incinerated residue was seen to correspond in distribution with the anthracotic pigment. Vice versa, it was constantly noted that where black deposits were seen in the stained sections, siliceous material was demonstrable in corresponding areas in the incinerated sections and had the same arrangement with respect to the tissue elements.

The black exogenous pigment of the lung and root glands, commonly designated as anthracotic pigment, is probably largely composed of carbon particles, and for the sake of convenience we shall follow the example of others and regard it as such. The great majority of siliceous particles in the stained sections are completely enveloped by carbon, either as a thin, homogeneous covering or in clusters of very small particles. When these sections are examined with the crossed Nicol prisms only an occasional mineral fragment can be seen, because the bulk of them are obscured by carbon. By the process of micro-incineration the carbon deposit is made to disappear completely and the siliceous particles, often surprisingly dense and numerous, are unmasked.

These particles vary greatly in size, shape and structure. The majority are under 2 microns, but a few are as large as 15 in their greatest dimension. In shape and structure the small ones appeared as amorphous grains with smooth, rounded surfaces. The larger ones were very variable; some were fibres that fitted Jones's¹⁸ description of sericite, while others were thicker and needle-like, with square or pointed ends;

others were flattened, laminated plaques, having the appearance of mica particles. A few were grain-like with irregular, sharp edges, quite like quartz. Most of the fragments were colourless, though a few had a faint yellowish tinge. So far as we were able to judge by means of a good petrological microscope, all the particles, even to the smallest, were anisotropic.

Occasionally one may be entirely misled as to the morphology of these particles, as the following experience indicates. One large anthracotic gland was incinerated *in toto* in a platinum crucible, in order to obtain an appreciable mass of siliceous residue for study. The ash was treated with concentrated HCl to remove the non-siliceous material, then washed, dried and mounted in Canada balsam. The particles tended to bunch together in small clumps, which, when viewed between crossed Nicol prisms, appeared to be composed entirely of fine, anisotropic fibres having the appearance of sericite. When spread out in a single layer and mounted in the same way a totally different appearance resulted. A few fibres were still seen, but the great majority of the particles now had the appearance of those in the incinerated sections described above.

The siliceous material described above was quite similar to that recovered from silicotic lungs and glands. The particles were much the same size and showed the same variations in shape. In the silicotics, however, there were perhaps more grain-like fragments suggestive of quartz.

'SILICA' IN NORMAL LUNG

The 'silica' percentages for the representative lung specimens varied from 38 to 292 mg. per cent, averaging 151. That the amount of 'silica' tends to increase with age is best seen by comparing the first half with the second half of the series. Up to and including the ninth case, whose age was 48 years, the 'silica' values range from 38 to 143 mg. per cent, averaging 90. The remaining 10 cases run from 52 to 82 years of age and from 119 to 292 mg. per cent 'silica', with an average of 217 mg. per cent.

The siliceous material in the lungs, as in the tracheo-bronchial glands to be considered presently, was more or less parallel in amount as well as in distribution to the anthracotic pigmentation. The topography of the latter is so

well known as to obviate the necessity of a detailed description. Suffice it to recall that the chief deposits are found in the lymphatic channels along blood vessels, bronchioles, bronchi, interlobular septa and subpleural connective tissues. In these locations the dust is incarcerated in the bodies of spindle-shaped cells (probably reticulo-endothelial) which are held together with numerous fine reticular fibres. Dust that has arrived more recently in the lung is contained within wandering phagocytes and may be located anywhere. Many of the heavier collections, sometimes referred to as intra-lymphatic plaques, occur at points where interlobular septa join the pleura. Thus, when relatively greater areas of pleura are included in the assay specimens (as in Cases 1 and 9, Table II), the 'silica' content is considerably higher than for the representative lung blocks which had pleura on one-quarter of their surface only.

Dust has a peculiar tendency to collect around long-standing scar formations in the lung. Nearly everyone is familiar with the blackened appearance of old tuberculous lesions (Ghon tubercles) in the adult lung. The reason for this seems fairly obvious. A fibrous lesion, of necessity, lays barriers in the pathway of the lymph streams and intercepts foreign material on its way to the lymph depots at the hilus or pleura. Blocks of tissue containing such lesions (Case 5, Table I; Cases 6 and 15, Table II) show 'silica' values two to five times as high as the representative blocks. Whether or not the scar is of tuberculous origin makes little difference; a healed infarct (Case 10, Table II) or a long-standing carcinoma metastasis accompanied by fibrosis (Case 16, Table II) produces the same effects. Histological examination and micro-incineration in these cases show the dust collected chiefly on the outside of the lesion, where it is phagocytized by reticular cells. Within the lesion small amounts of dust may occasionally be seen strewn unevenly through the interstices of the scar. The question arises whether this dust augments the scar, or, in other words, causes more fibrosis than would be present in a dust-free lesion. In this respect we believe the dust effect is negligible. It simply stimulates the proliferation of enough fixed-tissue cells to house the foreign particles, and that, in most cases, amounts to nothing more than a narrow fringe

of reticular tissue, exactly like that encountered in the dust-laden part of an anthracotic gland, which forms a mantle around the original scar.

Acute inflammatory processes or active tuberculous caseation does not appear to influence the 'silica' content of the lung areas involved. (Cases 5, 6, 8, 13 and 18, Table II).

'SILICA' IN ANTHRACOTIC GLANDS

The tracheo-bronchial glands showed 'silica' contents varying from 49 to 4,917 mg. per cent. Taking only the glands with the highest assay in each case, the average was 1,989 mg. per cent. For the first 9 cases, where the ages ranged from 13 to 48 years, the average of the highest assays was 1,070 mg. per cent, while for the remaining 8, aged 52 to 82 years, the average was 3,023 mg. per cent. There is, therefore, a decided tendency for the 'silica' accumulations in the tracheo-bronchial glands to increase with age. In general, the deeper the anthracotic pigmentation the higher the 'silica' content of the gland.

The ordinary anthracotic gland shows the heaviest dust deposit in its medullary parts, where elongated, fixed-tissue cells form a dense, dust-laden reticulum. These cells are probably derived from the reticulo-endothelial system. They have a parallel arrangement and are knit together by an abundance of fine reticular fibres. Collagen is not usually seen unless the dust deposits are extraordinarily heavy. The dust is contained within the cytoplasm of these cells, close to and often obscuring the elongated nucleus. As a rule, numerous wandering phagocytes, also full of dust, are present in the interstices of the reticular tissue as well as in the lymphoid tissue of the cortex, and especially along the sinusoids. This is the only lesion, if indeed it can be called a lesion, which results from the incarceration of what may be styled, for the sake of convenience, the normal dust deposits of the body. Fibrous nodules are occasionally observed in anthracotic glands, but they invariably lie in the cortex near the capsule, where dust deposition is minimal. Many, if not all of these nodules are judged to be of tuberculous origin (see below). Thus, though the dust deposits in anthracotic glands are rich in siliceous particles, they rarely, if ever, give rise to the so-called silicotic nodule. The tissue reaction to this dust as a whole consists merely of a proliferation of a sufficient number of reticular

cells to contain the foreign material. Occasionally, lymphatic glands around the head of the pancreas contain some anthracotic pigmentation. This probably represents an overflow from the tracheo-bronchial group. When such is the case these glands show an increased silica content (Case 5, Table I) and micro-incineration demonstrates the same kind of siliceous residue as seen in the mediastinal glands. Though we have not had an opportunity of studying specimens of anthracotic spleen there is every reason to believe that they too would contain corresponding amounts of siliceous material.

Tracheo-bronchial glands with old tuberculous lesions in them, whether calcified or fibrosed, contained distinctly less 'silica' than non-tuberculous glands from the same individual (Case 6, Table I; Cases 4, 8, 11 and 18, Table II). In the stained and incinerated sections it was seen that the bulk of the dust lay in remnants of lymphoid tissue outside the tuberculous lesions. Calcified areas were invariably free from dust deposits, but the fibrous parts of the lesions sometimes contained small amounts of carbon and siliceous material scattered loosely and unevenly through the interstices. Such areas often simulated the appearance of the fibrosis commonly encountered in silicotic lungs, even to the formation of dense hyaline nodules, but as this reaction was usually met with in close proximity to an obvious tuberculous nidus and as the dust content of the fibrous areas (including the nodules) was so variable and sometimes nil, it was regarded as a healed, fibroid tuberculous lesion rather than silicotic fibrosis. Giese¹⁹ in his study of tracheo-bronchial glands found some fibrous nodules which he regarded as silicotic, others which were tuberculous. The distinction which he makes between the two seems to us unfounded.

The two specimens of calcified mesenteric nodes showed negligible amount of 'silica' both by chemical assay and micro-incineration (Cases 17 and 19, Table II).

DISCUSSION

The presence of varying degrees of anthracotic pigmentation of pleura, lungs and tracheo-bronchial glands has long been recognized as a routine autopsy finding of little or no significance. That the ordinary black dust deposits of normal lungs and root glands contained

something more than carbon was probably first demonstrated by Kussmaul⁸ and Schmidt (1867); these authors found appreciable quantities of silicon (Kieselsäure) in such deposits. Probably the first attempt to analyze the dust content of isolated tracheo-bronchial glands was made by Woskressensky,¹⁷ who showed that there is a silicosis or silicatosis as well as an anthracosis in all ordinary root glands, and that this condition, while depending somewhat on occupation, tends to increase with age. Woskressensky worked out the 'silica' content as percentage of the ash, while our determinations are recorded as percentage of dry weight, yet the results are strikingly parallel.

Of the various occupations represented in our series of cases, a labourer showed the highest 'silica' content of the tracheo-bronchial glands. A farmer was amongst the highest, but a housewife showed nearly as much as either. The nominal occupation, therefore, conveys very little information upon which to judge of the probable origin of the siliceous material in any given case, but the uniformly high assays in practically all adult cases, regardless of the nature of the occupation, and the fact that the older individuals show the greater amounts, all point to the ordinary dusts of house and street, which everyone inhales, as the probable source. The black material is probably mainly soot, the siliceous material, clay, sand and stone particles.

Whatever be the nature of the siliceous particles in ordinary anthracotic deposits of lungs and root glands, even though they are morphologically similar to the siliceous particles recovered from silicotic lungs, their pathogenicity is relatively slight. Whether it be that in the mixture some elements neutralize the disease-producing qualities of other elements or that the particles are all innocuous cannot be stated.

Sladden, Hackman, Stuart and Faulds and others have implied that if a lung or a part of a lung contains 1,000 or more milligrams per cent of 'silica', it is necessarily involved in a serious fibrosis. Whether this be true or not in the case of the lung, it is certain that peribronchial glands may carry a much higher 'silica' content (up to 4,917 mg. per cent dry weight) over long periods of time without showing any real fibrosis. Because siliceous dust, like anthracotic pigment, tends to collect around scars in the lung, no

matter what the occupation of the individual or the nature of the scar, we believe many people have erroneously regarded this dust as the cause rather than as the result of the scar. Greenhow,²⁰ for example, in 1866, when he found siliceous fragments in fibrosed parts of a hemp worker's lung, regarded these fragments as the probable cause of the lesion. In view of our findings it is at least possible that the siliceous material which he found was an innocent factor.

CONCLUSIONS

It will be understood that the term "silica" when used with reference to lung assays, denotes simply an equivalent amount of the element silicon, in accordance with chemical usage, and gives no indication of the amount of silica versus silicates.

All tissues of the human body contain traces of 'silica' averaging considerably less than 50 mg. per cent. Tough connective structures do not differ in this respect from softer parts.

'Silica' in human tissues in excess of 100 mg. per cent (dry weight) may be satisfactorily demonstrated by the process of micro-incineration. It is in the form of fine mineral fragments and may be safely regarded as exogenous.

The lungs and tracheo-bronchial lymph glands contain exogenous 'silica' roughly proportional in amount to the degree of anthracotic pigmentation.

In adults' lungs (exclusive of hazardous occupations) the 'silica' content averages about 151 mg. per cent. The average figure for persons over 52 years of age was 217 mg. per cent.

The pleura and subpleural tissues contain relatively more 'silica' than the parenchyma of the lung.

Parts of the lung bearing areas of long-standing cicatrization, no matter of what etiology, contain much more 'silica' than other parts of the lung. For such areas the figures ran as high as 522 mg. per cent.

The process of acute inflammation or caseous (tuberculous) necrosis was associated with no alteration in the 'silica' content of the affected tissues.

The tracheo-bronchial glands of most adults contain 2 to 20 times as much silica as the corresponding lungs. The blackest glands in a

series of 9 persons from 13 to 48 years of age averaged 1,070 mg. per cent 'silica'; of 8 persons, 52 to 82 years of age, 3023 mg. per cent.

Tracheo-bronchial glands containing old tuberculous lesions have much less 'silica' than non-tuberculous glands.

The siliceous particles recovered from the lungs and glands in this study were morphologically, chemically, and by simple examination with the polarizing microscope similar to the mineral residues recovered from silicotic lungs, yet they were evidently innocuous, for no significant lesion could be ascribed to them.

When employing chemical assay as an aid in the diagnosis of silicosis it is necessary to know from what part of the lung the assay specimen comes, whether it includes root glands, large areas of pleura or old scar formations, for in these instances the assay is bound to include appreciable quantities of non-pathogenic silicon compounds.

The authors wish to record their gratitude to Sir Frederick Banting and Prof. Oskar Klotz for their kindly assistance and criticism, and to Miss Margery Dolan for her capable work in connection with the chemical assays.

REFERENCES

1. STRACHAN, A.: The pathological anatomy of silicosis, *Proc. Transvaal Mine Med. Officers' Ass.*, Johannesburg, Spec. Supp., Oct., 1930, p. 9.
2. KETTLE, E. H. AND ARCHER, H. E.: The differential diagnosis of tuberculo-silicosis, *Proc. Roy. Soc. Med.*, 1933, 26: 811.
3. KING, E. J.: The estimation of silica in tissues, *J. Biol. Chem.*, 1928, 80: 25.
4. SLADDEN, A. F.: The silica content of lungs, *The Lancet*, 1933, 225: 123.
5. HACKMANN, O.: Über den Kieselsäuregehalt pneumokoniotischer Lungen, *Beitr. z. path. Anat. u. z. allg. Path.*, 1933, 90: 623.
6. STEWART, M. J. AND FAULDS, J. S.: The pulmonary fibrosis of hematite miners, *J. Path. & Bact.*, 1934, 39: 233.
7. McNALLY, W. D.: Silicon dioxide content of lungs in health and disease, *J. Am. M. Ass.*, 1933, 101: 584.
8. KUSSMAUL, A.: Die Aschenbestandteile der Lungen und Bronchialdrüsen, *Deutsches Arch. f. klin. Med.*, 1867, 2: 89.
9. FOWWEATHER, F. S.: The silica content of normal and silicotic lungs and its bearing on the problem of silicosis, *Chemistry & Industry*, 1934, 53: 713.
10. KETTLE, E. H.: The detection of dangerous dusts, *The Lancet*, 1934, 226: 889.
11. GARDNER, L. U.: The pathological reaction in various pneumoconioses, *J. Am. M. Ass.*, 1933, 101: 594.
12. MILLER, J. W. AND SAYERS, R. R.: The physiological response of the peritoneal tissue to dusts introduced as foreign bodies, *U.S. Pub. Health Report*, 1934, 49: 80.
13. SCHULZ, H.: Zur Physiologie und Pharmakodynamik der Kieselsäure, *Deutsche med. Wchnschr.*, 1903, 29: 673.
14. KRAUT, H.: Über den Kieselsäuregehalt des menschlichen Blutes und seine Veränderungen durch Kieselsäurezufuhr, *Zeitschr. f. physiol. Chem.*, 1931, 194: 81.
15. KING, E. J. AND STANTIAL, H.: The biochemistry of silicic acid. Micro-determination of silica, *Biochem. J.*, 1933, 27: 990.
16. IRWIN, D. A.: The histological demonstration of siliceous material by micro-incineration, *Canad. M. Ass. J.*, 1934, 31: 135.
17. WOSKRESENSKY: Untersuchung der Lungen und Bronchialdrüsen auf Silicate, *Centralbl. f. allg. Path. u. path. Anat.*, 1898, 9: 296.
18. JONES, W. R.: Silicotic lungs: the minerals they contain, *J. Hyg.*, 1933, 33: 307.
19. GRESE, W.: Die schwierige Induration der Lungenlymphknoten, *Beitr. z. path. Anat.*, 1933, 90: 553.
20. GREENHOW, E. H.: *Trans. Path. Soc. London*, 1866, 17: 36.

CLINICAL EXPERIENCES WITH WHEAT GERM OIL (VITAMIN E)*

BY E. M. WATSON, M.D., F.R.C.P.(EDIN.),

*Associate Professor of Pathological Chemistry, University of Western Ontario Medical School,
London, Ont.*

EXPERIMENTAL investigations have succeeded in establishing a relationship between diet and fertility in small animals such as mice and rats. Whether reproduction in other mammals, including the human species, is dependent in any way upon a specific extrinsic factor is a problem which is under consideration.

Until comparatively recently the view was held that a diet which would provide for an animal's well-being was also sufficient for the generative functions. In 1922 Evans and Bishop¹ reported that rats subsisting upon supposedly complete dietaries would not reproduce unless certain food substances were included in their rations. The animals, apart from the infertility, appeared to be normal. The females exhibited natural oestrus cycles and would breed and conceive, but they failed to deliver their young on account of some disturbance which caused intra-uterine death and subsequent resorption of the fetuses. It was observed that the inclusion of whole wheat cereal, fresh lettuce leaves or dried alfalfa in the diets of the pregnant animals permitted reproduction to occur in a normal manner. While it was evident that the sterility of these rodents was due to the absence of some essential element from their food, the condition could not be related to any of the hitherto known vitamins. Consequently, Evans and Bishop designated the unknown substance necessary for reproduction as the accessory food factor X. Some such agent was anticipated, probably, by Mattill and Conklin² who found that rats which were reared on whole milk, while appearing to be healthy, were usually sterile. These observers suggested, therefore, that milk was deficient in some dietary factor which was indispensable for reproduction, especially in the female. Sure³ independently arrived at the same conclusions as did Evans,

Mattill and their co-workers, namely, that sterility could be produced in laboratory animals by means of certain test diets and prevented by the addition of foods which contained, presumably, the substance X. Sure proposed that the newly discovered anti-sterility factor be named vitamin E, a term which has been universally adopted.

The fat-soluble vitamin E is present in several natural foods, especially in the green leaves of vegetables, notably lettuce. It exists in the seeds of plants, where it occurs exclusively in the embryo of the seeds. Wheat germ is remarkably rich in the factor and wheat germ oil is the greatest known source of vitamin E. Apparently the natural foods provide an amount of the substance which is sufficient for all ordinary requirements, but deprivation of it in animals leads to definite pathological changes which are different in the two sexes. The males suffer irreparable degeneration of the germinal epithelium of the testes, whereas the sex glands of the females are unaffected. The developing fetus is, however, particularly susceptible to lack of vitamin E. According to Evans and Burr⁴ probably all the fetal tissues require the factor but it appears that the middle germ layer and its products are especially sensitive to it. An inadequate supply of E-substance results in the death of the fetuses and their subsequent resorption or expulsion from the uterus. The sterility in the female produced by a deficiency of vitamin E is not incurable, as is the condition in the male.

Little practical application has been made as yet of the results of the animal experiments. The observations of Vogt-Möller and Bay,⁵ however, offer some indication that wheat germ oil may prove to be of value in stock breeding. Whether it will be acceptable as a therapeutic or preventive agent in medical practice remains to be seen, but on the basis of the effects observed in animals, together with certain theoretical considerations, it may be argued that the

* Read before the Section on Pharmacology and Therapeutics at the joint session of the Canadian and American Medical Associations, Atlantic City, on June 12, 1935.

employment of vitamin E-containing products should aid in the restriction of antenatal mortality in human subjects. In support of this hypothesis are some data pertaining to the use of wheat germ oil in a limited number of clinical cases. For example, Vogt-Möller⁶ presented the records of two apparently healthy women, one of whom had experienced four and the other five spontaneous abortions, for which no cause could be ascribed. Each of these women during a subsequent pregnancy received wheat germ oil and went through the whole period of gestation successfully and delivered a normal, full-term, living child. In a later communication, the same author⁷ reported a series of 19 cases of habitual spontaneous abortion and 4 cases of primary sterility in women, all of whom were treated exclusively with a preparation of wheat germ oil known as "Fertilan". The results of the treatment were regarded as favourable, in that the birth of living children was attained in 16 of the 19 cases of repeated abortions and in 2 of the 4 cases of sterility. Juhász-Schäffer⁸ mentioned 5 cases of habitual abortion where full-term, normal, living babies were born when nothing except wheat germ oil had been prescribed.

THE PRESENT INVESTIGATION

The preliminary report of Vogt-Möller in 1931 was considered to be sufficiently encouraging to warrant further investigation relative to the possible clinical applicability of vitamin E therapy. The subject was approached from a clinical-biological point of view and the research has been carried on with the cooperation of a number of medical practitioners, who prescribed wheat germ oil, which was prepared in the laboratory, to patients who presented certain sterility problems. Female patients only received the treatment, and this communication constitutes a report of the experiences with wheat germ oil therapy after three years' clinical trial.

At the beginning of the investigation, the anti-sterility potency of the oil was tested on mice and rats. Very small quantities of it were found to permit fertility in females which had been rendered sterile by means of a vitamin E-deficient diet. Since the method of manufacture of the oil was not modified materially during the course of the research and the source of supply of the germ did not vary, the product

as distributed for clinical use was assumed to represent an active vitamin E-concentrate. Since nothing was known definitely regarding the optimum dose of wheat germ oil for human consumption, the quantity which was recommended to be taken daily by mouth was specified arbitrarily as one drachm. In some instances, however, particularly in cases of threatened abortion, a higher dosage was advocated. For patients with a history of habitual abortion it was suggested that the regular use of the oil be instituted as soon after the commencement of pregnancy as possible, and that its administration be continued until well beyond the time when the abortions usually had occurred. In many cases its use was persisted until the completion of pregnancy.

RESULTS

The wheat germ oil was prescribed to a number of patients respecting whom spontaneous abortions, threatened abortions, or involuntary sterility constituted the principal abnormalities. The present report deals with the results obtained in a series of 65 women who received the treatment. The patients have been classified into four groups as follows.

Group I.—Pregnant women who had experienced two or more spontaneous abortions previous to receiving wheat germ oil treatment. (Habitual abortion.)

Group II.—Pregnant women who had experienced one spontaneous abortion previous to receiving wheat germ oil treatment.

Group III.—Cases of threatened abortion.

Group IV.—Women who sought medical advice on account of failure to become pregnant. (Sterility group.)

The patients included in Groups I and II, with but two exceptions, were pregnant at the time that the treatment with wheat germ oil was started. The purpose of the treatment was to favour the continuation of the pregnancies. The cases in Group III received the oil only after the onset of the symptoms of threatened abortion,* and its administration was a part of the treatment for that condition. Those in Group IV were not pregnant at the time that the oil was used although several had been pregnant previously. The object of the treatment in these cases was to facilitate impregnation.

All the patients who received the treatment were desirous of offspring, and none presented

* The word "abortion" as employed in this paper denotes the spontaneous cessation of pregnancy at any stage in its course, barring the delivery of a viable fetus.

any recognizable gynecological conditions which might have accounted for their reproductive failures. Rarely, a condition of hypothyroidism existed, but the correction of this alone did not seem to influence the generative functions. In the majority of the cases Wassermann tests were performed on the blood serum with negative results. In no case was the existence of syphilis suspected. In the habitual abortion group the abortions occurred spontaneously and without obvious cause, and, in some instances, considerable mental distress was occasioned by their repetition. A few of the patients despaired of ever becoming mothers. In the majority of

the results must be viewed, therefore, in the light of the contingencies relative to the circumstances.

Habitual abortion.—In Table I there is listed a series of 11 patients who had sustained from 3 to 15 spontaneous abortions prior to the exhibition of wheat germ oil. Of these 11 women, 9 went to term and were delivered of healthy living children. Six of the patients under this régime completed a pregnancy for the first time. In case No. 10 a condition of accidental hemorrhage resulted in abortion but in case No. 11 the pregnancy in its early stage terminated spontaneously, for no known reason, 25 days after the wheat germ oil treatment was started.

Of the 17 wheat-germ-oil-treated patients noted in Table II, each of whom had had two spontaneous abortions, 12 gave birth to healthy living children after the use of the oil. In 5 cases the pregnancies were interrupted by spontaneously occurring abortions, and in one

TABLE I.

THE RESULTS FOLLOWING TREATMENT WITH WHEAT GERM OIL IN A GROUP OF PREGNANT WOMEN WITH HISTORIES OF THREE OR MORE PREVIOUS SPONTANEOUS ABORTIONS.*

Case No.	Age (Yrs.)	Years of marriage	Number of abortions	Time of occurrence of abortions	Children born alive at term	Diagnosis	Results	Remarks
1	34	15	15	1 to 5 mos.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	Delivery by elective Caesarean section 3 wks. before term.
2	39	19	10	2 to 8 mos.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	
3	33	9	5	1 at 2nd mo 4 at 7th mo.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	
4	35	11	4	6 wks., 3 mos. and 7 mos.	2	Habitual abortion.	Normal pregnancy. Healthy, living child.	Delivery by elective Caesarean section at term.
5	35	14	3	At or near term	1	Habitual abortion.	Normal pregnancy. Healthy, living child.	
6	24	4	3	2 to 3 mos.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	
7	30	6	3	1 to 2 mos.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	
8	33	12	3	2 to 4 mos.	2	Habitual abortion.	Normal pregnancy. Healthy, living child.	
9	25	4	3	2, 3 and 7 mos.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	
10	28	8	3	6½ mos., 7 mos. & term	0	Habitual abortion.	Miscarriage at 6 mos.	
11	28	7	3	2 to 4 mos.	0	Habitual abortion.	Abortion 25 days after starting wheat germ oil.	

*The term *abortion* as employed in this paper includes, in addition to the cases falling within the generally accepted definition of the word, miscarriages and still-births.

the abortion and sterility cases no therapeutic measures except the use of wheat germ oil were instituted. But the patients with signs of threatened abortion were subjected to the usual management for that condition plus wheat germ oil. The opportunity for a complete investigation of the procreative faculties of the patients or their husbands, such as outlined by Meaker,⁹ was not afforded except in an occasional instance. This omission may detract somewhat from the scientific value of the research, but it should be understood that the investigation was conducted for the most part under conditions such as prevail in general medical practice and

of these (No. 26) a definite toxic state, associated with marked albuminuria existed, which complication contributed probably to the otherwise unexpected cessation of the pregnancy. No explanation is offered for the interruptions in the other four cases.

One previous abortion.—Table III depicts 9 wheat-germ-oil-treated patients, each of whom had experienced one previous spontaneous abortion. In 8 of these the birth of healthy, living children occurred; but in one abortion took place a short time after the use of the oil was commenced. It will be observed in this Table, as well as in Table II, that several of the patients threatened to abort, but with the exception of the instances noted abortions did not follow.

Threatened abortion.—Fifteen patients, as indicated in Table IV, were treated for the symptoms of threatened abortion, the majority after bleeding had begun. In 11 of these, the pregnancies continued uninterruptedly, to terminate in natural deliveries, but in four instances the abortions became inevitable.

TABLE II.

THE RESULTS FOLLOWING TREATMENT WITH WHEAT GERM OIL IN A GROUP OF PREGNANT WOMEN EACH WITH A HISTORY OF TWO PREVIOUS SPONTANEOUS ABORTIONS.

Case No.	Age (Yrs.)	Years of marriage	Time of occurrence of abortions	Children born alive at term	Diagnosis	Results	Remarks
12	31	9	7 to 10 wks.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	Cramp-like abdominal pain 4th to 5th month. Chronic appendicitis (?)
13	28	5	3 mos. and 7 mos.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	
14	29	4	2 mos. and 3 mos.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	
15	23	4	7 mos. and 8 mos.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	
16	24	4	?	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	Crampy pains and slight flowing during 2nd month
17	37	6	6 mos. and 7 mos.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	
18	21	2	2½ mos. and 6 mos.	0	Habitual abortion. Threatened abortion.	Normal pregnancy. Healthy, living child.	
19	33	11	2 to 3 mos.	1	Habitual abortion.	Normal pregnancy. Healthy, living child.	
20	33	?	2 mos.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	Slight bleeding in 6th month. Pre-eclamptic toxæmia in 8th month. Labor induced.
21	33	7	3 wks. and 2½ mos.	0	Habitual abortion.	Normal pregnancy. Healthy, living child.	
22	27	8	7 and 8 mos.	0	Habitual abortion.	Healthy, living child.	
23	33	5	3 wks. and 7 wks. premature	0	Habitual abortion.	Healthy, living child.	
24	28	?	5 mos.	1	Habitual abortion.	Spontaneous abortion at 8 wks.	Delivery 2 weeks premature.
25	31	5	4 to 5 mos.	0	Habitual abortion. Threatened abortion.	Miscarriage at 5 mos.	
26	32	5	6 to 7 mos.	1	Habitual abortion.	Still-birth.	
27	25	7	5 mos. and 6 wks.	0	Habitual abortion.	Miscarriage at 5 mos.	
28	30	9	2 to 3 mos.	0	Habitual abortion.	Abortion at 6 wks.	Pregnancy toxæmia.

TABLE III.

THE RESULTS FOLLOWING TREATMENT WITH WHEAT GERM OIL IN A GROUP OF PREGNANT WOMEN, EACH WITH A HISTORY OF ONE PREVIOUS SPONTANEOUS ABORTION.

Case No.	Age (Years)	Years of marriage	Time of occurrence of abortions	Children born alive at term	Results	Remarks
29	35	2	5th month	0	Healthy, living child.	Spontaneous delivery, 3 weeks premature. Patient received thyroid medication in addition to W.G.O.
30	28	4	2 mos.	0	Normal pregnancy. Healthy, living child.	
31	25	?	6½ mos.	0	Normal pregnancy. Healthy, living child.	
32	29	7	10 wks.	1	Normal pregnancy. Healthy, living child.	
33	23	4	3 to 4 mos.	0	Normal pregnancy. Healthy, living child.	Frequent painful uterine contractions with some bleeding during pregnancy. Delivery at term.
34	24	3	7 to 8 mos.	0	Normal pregnancy. Healthy, living child.	
35	28	3	2 mos.	0	Normal pregnancy. Healthy, living child.	
36	30	?	2½ mos.	1	Normal pregnancy. Healthy, living child.	
37	36	?	6 wks.	2	Spontaneous abortion at 6 mos.	

the uterus and they supervise the early stages of the development of the embryo. Vitamin E appears to act as an important adjunct in these functions by supplementing the hormonal activities during the embryonic phase of existence; but, more specifically, it is a requisite for the further development of the fetus and the completion of pregnancy. A somewhat similar view had been expressed by Diakov and Krizenecky.¹²

While opportunity is thus afforded for vivid speculation regarding the possible relationships between vitamin E and certain of the hormones, there is little if any positive evidence upon which to theorize concerning the matter. It would appear, however, that vitamin E bears more resemblance as regards chemical features, physiological properties, and clinical significance to the luteal hormone (progesterin) than to other hormones. Both are found in animals and plants associated with substances of a lipoidal nature and are extractable with them by means of the solvents of the lipoids. Both have an influence upon the product of conception within the uterus. Judging from the recent clinical reports of Krohn *et al.*,¹³ it seems that the effects of the treatment of habitual abortion with progesterin and with wheat germ oil are rather similar. According to the opinion of Pratt,¹⁴ however, there is some doubt regarding the importance of progesterin in the human economy. Spagnol¹⁵ has suggested that certain glandular extracts which have been employed therapeutically in conditions related to pregnancy may owe their effectiveness to a content of vitamin E derived from the tissues used in the preparation of the extracts.

A successful pregnancy following one previous abortion is not of great consequence so far as the determination of the effect of wheat germ oil as an anti-abortient is concerned. It would, indeed, be rather extravagant to attribute the completion of a pregnancy solely to the oil when but a single interrupted gestation preceded the event. But the progression of a pregnancy to term and parturition coincident with the use of wheat germ oil after numerous spontaneously interrupted gestations doubtless permits of a different interpretation.

Although most of the few patients with threatened abortion in which the vitamin E preparation was used after bleeding had begun

failed to abort, it is questionable if the oil was entirely responsible for the continuance of the pregnancies, since the usual treatment for the condition was employed as well as the administration of the wheat germ oil. Some allowance should be made probably for the cases in which the vitamin E was not administered until the manifestations of abortion were well established and the condition was therefore too far advanced to expect benefit from any form of treatment.

SUMMARY

A definite decision regarding the therapeutic value of vitamin E must be reserved pending the results of further clinical observations. From the information at hand, however, it would appear that the factor does play a part in the promotion of gestation in women. On the grounds of circumstantial evidence, it may be inferred that vitamin E, as it occurs in wheat germ oil, offers promise of being beneficial in the prevention of habitual abortion and, probably, in the treatment of some cases of threatened abortion.

The author wishes to express his grateful appreciation to the physicians and surgeons, too numerous to mention individually, who prescribed wheat germ oil to their patients and who supplied the clinical records. Without their cooperation this investigation could not have been accomplished. Also, thanks are due to Mr. A. Barber, technical assistant, for preparing the wheat germ oil used in the research.

REFERENCES

1. EVANS, H. M. AND BISHOP, K. S.: On the existence of a hitherto unknown dietary factor essential for reproduction, *Science*, 1922, 56: 650, and *Am. J. Physiol.*, 1922-1923, 63: 396.
2. MATTILL, H. A. AND CONKLIN, R. E.: The nutritive properties of milk, with special reference to reproduction in the albino rat, *J. Biol. Chem.*, 1920, 44: 137.
3. SURE, B.: Dietary requirements for reproduction. II. The existence of a specific vitamin for reproduction, *J. Biol. Chem.*, 1923-1924, 58: 693.
4. EVANS, H. M. AND BURR, G. O.: The antisterility vitamin, fat-soluble E, *Mem. of Univ. of California*, 1927, vol. 8.
5. VOGT-MÖLLER, P. AND BAY, F.: On the treatment of sterility in cows with wheat germ oil (Vitamin E), *Veterinary J.*, 1931, 87: 165.
6. VOGT-MÖLLER, P.: Treatment of habitual abortion with wheat-germ oil (Vitamin E), *The Lancet*, 1931, 2: 182.
7. VOGT-MÖLLER, P.: Treatment of sterility and habitual abortion with wheat-germ and wheat-germ oil (Vitamin E), *Act. Obstet. et Gynec. Scand.*, 1933, 13: 219.
8. JUHASZ-SCHAEFFER, A.: Das E-Vitamin, *Ergebn. d. inner. Med. u. Kind.*, 1933, 45: 129.
9. MEAKER, S. R.: Human Sterility, Baillière, Tindall & Cox, London, 1934.
10. KENNEDY, W. P.: Diet and sterility, *Physiol. Rev.*, 1926, 6: 485.
11. MACOMBER, D.: Diet in the etiology and treatment of sterility, *J. Am. M. Ass.*, 1929, 93: 1213.
12. DIAKOV, F. A. AND KRIZENECKY, J.: Vitamin E and pituitary hormone, *Proc. Soc. Exper. Biol. & Med.*, 1933, 31: 59.
13. KROHN, L., FALLS, F. H. AND LACKNER, J. E.: On the use of the lutein hormone, progesterin, in threatened and habitual abortion, *Am. J. Obst. & Gyn.*, 1935, 29: 198.
14. PRATT, J. P.: The human corpus luteum, *Arch. Path.*, 1935, 19: 409.
15. SPAGNOL, G.: Relations between vitamin E and sex hormones, *Rev. Sud-Amer. de Endocrinol.-Immunol. y Quim.*, 1934, 17: 553.

THE VEGETABLE INSULINOIDES AND THEIR THERAPEUTIC INDICATIONS

BY H. LABBÉ,

*Associate Professor of the Faculty of Medicine of Paris,**Paris, France*

THE discovery of insulin has been a decisive step in the treatment of diabetes. The remarkable hypoglycæmic properties possessed by this internal secretion of the pancreas, as well as its regulating effects on the metabolism of carbohydrates, have made of it immediately the heroic remedy against hyperglycæmias refractory to dietetic treatment and against confirmed diabetes, often complicated by acidosis. Further, the numerous research workers who have studied insulin have discovered many other interesting properties of this substance. In this regard let us only mention the remarkable accelerating effect produced by insulin on the nitrogen exchanges. This effect, first made evident experimentally by ourselves and Theodoresco, and studied by numerous authors from the therapeutic angle, explains the success of the fattening cures and the recovery of thin patients and of certain cachectic ones.

But insulin has certain disadvantages. It is liable to produce accessory effects which render its use in different cases a delicate matter. It is, in any case, a medication which must be administered and carefully watched by a physician. Therefore, the physicians' ideal should be to have at their disposal a medicament which can produce in hyperglycæmic and diabetic patients, and in all those who for various reasons might need such treatment, the fundamental action of the insulin, but with none of its secondary or accessory effects. It is for these reasons that almost as soon as insulin was discovered an effort was made to find if certain vegetable cells, like those of the animal pancreas, had the power to secrete substances having properties analogous to those of insulin, but which at the same time would be less dangerous to apply and easier to manipulate. This was the beginning of the study of the vegetable "insulinoides" undertaken by a number of physiologists and chemists. Their researches have not been made in vain, and the results achieved have seemed to us encouraging enough

to justify this account of the present state of the problem.

The first of these researches seems to have been the work of Collip¹ on the existence of a new "glucokinine hormone" in vegetable tissues. At first, it was possible to derive such active extracts from yeast. But, in fact, numerous vegetable tissues, and even some bacteria also give "insulinoides". As early as 1923 Dubin and Corbitt² succeeded in isolating a hypoglycæmic principle from extracts of raw vegetables. However, they encountered a difficulty, as is generally the rule in such cases. This was the coexistence in the extract of hypoglycæmic and hyperglycæmic substances. In fact, subsequently to the injection of extracts of raw vegetables an increase of the sugar content of the blood occurred, followed inconstantly by a decrease to below normal. By treating methodically these raw extracts these workers were successful in separating a hypoglycæmic from a hyperglycæmic principle. The antagonistic effects of the two principles explain the abnormal physiological effects (delay or prolongation of hypoglycæmia) obtained with the whole extract.

In 1924, Eisler and Portheim³ extracted from beans substances having on the metabolism of the carbohydrates effects analogous to those of insulin. These authors found that preparations made with extracts of dry beans (*Phascolus multiflorens*) contain a glycokinetic substance which reduces the normal glucose content of the rabbit's blood without producing convulsions. Further, such extracts paralyze the hydrolytic action of the salivary diastases on starch. They also reduce the starch and sugar contents, at the same time increasing the acetaldehyde contents of bean pulp (*Phascolus vulgaris*) digested at 36° C. in physiological solution.

For his part, Shikunami⁴ found that *Aspergillus orizæ*, yeast, the bark and leaves of *Taraxacum cuspidata* and of *Pinus densiflora*, all contain substances capable of producing a prolonged

reduction of the blood sugar concentration and of the quantity of glycogen contained in the liver and the muscles. In certain bacteria able to separate sugars, the same author discovered similar "insulinoid" substances. Kaufman,⁵ pursuing the search for insulinoides in the leaves of the whortleberry, beans, and the shell of acorns, extracted from them substances having the property of lowering the normal sugar content of rabbit's blood. On the other hand, he extracted hyperglycæmic principles from pea pods, sambal fruit and cotton-plant roots, and, since other authors have extracted a hypoglycæmic principle from these same sources, it confirms the coexistence rule stated previously. Besides, almost all Kaufman's extracts contained reducing substances, and our personal work has shown that some sugars, like maltose, possess a strong hyperglycæmic power.

Clinical tests made with bean pod extract on diabetic patients resulted in a marked improvement in their tolerance of carbohydrates, as well as a diminution of glycosuria. Whortleberry tea, tried on similar patients, acted the same, but more weakly. As to the other vegetable extracts prepared by Kaufman he found them to be inactive. In a subsequent work the same author stated precisely the effects of bean (species *phaseolus*) pod extract on the blood sugar content, on glycosuria and on acidosis. Tolerance was noticed and the glycosuria diminished in a great number of diabetic patients treated. It is in acidosis that the effects were particularly favourable. Many patients showed simultaneously a diminution of glucose and acidotic substances in the urine, and at the same time a lowering of the blood sugar level. Moreover, the intravenous injection of these extracts is harmless, and the author did not notice any accident in rabbits. In fact, he found that after a prolonged use of the bean extract diabetic patients became refractory to it. As a matter of fact, after using it for one month, sudden and very severe relapses, with a marked rise of the sugar level, were observed. It may be that the preparation of the extracts is a matter of selection of the raw materials (maturation of the beans). The problem is not solved.

Simola resumed in 1927 the study of the "insulinoides" which he has extracted from vegetable cells (potato, husks of oats, rhubarb

leaves) and from certain bacteria. The preparation of said extracts was conducted in a manner similar to that which gives the pancreatic insulin. The best results have been obtained by extraction by means of acetone from the raw material previously macerated with picric acid. Simola's various extracts have acted inconstantly on the sugar contents of the rabbit's blood. The results were better after the extracts had been purified by bone-black. The highest diminution noticed in these conditions was 40 per cent after two hours. Von Euler⁶ resumed the study of the hypoglycæmic principle already discovered in yeast, and attempted to state precisely its conditions of extraction, but his study did not add any important fact to those already known.

One of the most interesting vegetable "insulinoid" extracts, one that has been found to give the most constant results and that has shown itself to be perfectly harmless in its already numerous applications on diabetic patients, seems to be the one that we have prepared in 1930 with Donard. We started with the radicles of germinated barley. The aqueous extract was purified by precipitation by absolute alcohol and consecutive dialysis of the precipitate. Such an extract possesses remarkable hypoglycæmic properties. In the normal rabbit the fall of the glycæmia below the initial figure attained an average of 30 to 35 per cent after two hours. In some cases it exceeded 60 per cent. This fall of the glycæmia lasts for a certain length of time. The clinical effects of this extract have been satisfactory. The fall of the glycæmia rate is constant after ingestion of the extract. In the observations made in Professor Gougerot's department of the Hôpital Saint-Louis of Paris this fall attained about 25 per cent. Maisin, Pourbaix and Vassiliadis, who, several months later, studied the effects produced by concentrated infusions of radicles of barley, have obtained diminution of glycæmia of 17 per cent on normal human subjects. In addition to this, they efficiently counteracted a hyperglycæmia produced by the ingestion of a large quantity of glucose (60 grams) by the consecutive ingestion of barley extract. The glycosuria as well as the glycæmia in diabetic patients is very regularly and considerably reduced. According to some of our observations, acidosis has also

seemed to be influenced. A considerable diminution in the elimination of acetone and b-oxybutyric acid was noticed.

In practice, the administration per os or subcutaneously of such extracts involves no notable difficulties or inconveniences. The results that we have obtained at the start were a little inconstant. This was likely due to the fact that the extracts contained a certain proportion of maltose, the considerable hyperglycæmic power of which we have proved with Donard.⁷ We have also found that barley radicle extracts contain hordeine, the hyperglycæmic power of which has been pointed out by Tanret. Finally, after elimination of these two substances, the hypoglycæmic action of our dry radicle extract, purified and injected in the form of an aqueous solution at 0.076 per kilo, produced in the rabbit a drop of 37.9 per cent of glycæmia, still lasting after three hours. What is the chemical nature of these "insulinoides" which are found so commonly in the vegetable world? Are they to be considered as substances homologous with insulin? Although researches in this respect are not numerous as yet, we do not seem to be entitled to do so. Simola, whose work we have mentioned above, is inclined to consider the active substances of the different extracts which he has studied as derivatives of guanidine; this would bring them near the artificial insulins. Boivin, on the contrary, from a study of the active yeast extracts, does not feel justified in setting aside completely the hypothesis of an analogy between the composition of the "insulinoides" and that of the pancreatic insulin. According to this author, the absence of an appreciable quantity of insulin in the hypoglycæmic yeast extracts is "likely" but "not absolutely certain". From the chemical point of view, the yeast insulin might be, like insulin itself, a polypeptidic substance. At any rate, it would not be a simple biguanidic substance of the type of decamethyleguanidine or "synthaline" (first manner, 1926), or of "synthaline B" (now sold commercially) and which is dodecamethylene-diguanidine. The sum of the chemical knowledge concerning the nature of the vegetable and bacterial "insulinoides" is still small. It seems that we have the right to think that vegetable insulinoides are not insulin, and are also distinct from the artificial derivatives of guanidine which have shown hypoglycæmic properties.

As the facts that we have summarized above well show, chemical research on the constitution of insulinoides has not yet given any decisive explanation of their origin and structure. On the other hand, if the lowering of glycæmia by introduction of the insulinoides into the organism seems to be the essential property which allies them with insulin itself, we see, nevertheless, that their mode of action differs notably from that of insulin. They are weaker, and their action is more prolonged than that of pancreatic insulin.

Now, further, for several years past, the favourable action of certain varieties of vitamin B (B3) on the general metabolism of the carbohydrates has been studied and precisely stated.

The vitamin B extracts are obtained from their natural, exclusively vegetable, sources by processes quite analogous to those permitting the concentration of the glucokinines or "insulinoides", especially the glucokinine that we have, with Donard, extracted from barley germs, and which, as we have just seen, has by far the most active and regular effects. With this in mind, a question must arise: Is the active substance of the concentrated extracts of vitamin B identical with the active substance of the insulinoidic extracts of barley germs? The experimental work that we have undertaken with our collaborator Donard in order to answer this question has led us to conclusions which are quite clear.

Young rats from the same litters have been submitted to a diet completely lacking in vitamin B. After a sufficient length of time (thirty-three days), the second lot was submitted curatively to an administration of different barley germ extracts: 1st, total technical (insulinoidic) Donard and Labbé extract; 2nd, the same extract, "devitaminized" by fuller's earth; 3rd, the extract from the fuller's earth having retained the barley extract vitamin. To the first lot, and since the beginning of the privation of vitamin B, were administered preventively: 1st, the total extract; 2nd, a selected extract, deproteinized and concentrated to four-fifths; the 3rd, a vegetable extract of different origin and already known to contain a high proportion of vitamin B.

One rat submitted to the normal diet as well as one deprived of vitamin B had been kept aside from each of the two lots. We tabulate below the results obtained.

EXPERIMENTS ON WHITE RATS

No.	Diets	Days of privation of vitamin B	Duration in days	Initial weight	Dead weight at end of experiment
1.	Normal .....	..	Alive the 64th day	37	95
<i>A—Preventively</i>					
2.	Privation B .....	..	33	..	..
3.	Privation B + deproteinized extract, concentrated to 1/5ths .....	..	64	..	..
4.	Privation B + concentrated D & L extract .....	..	43	..	..
5.	Privation B + vitamin B extract .....	..	Alive the 52nd day	..	..
<i>B—Curatively</i>					
7.	Privation B .....	..	46	43	50
8.	Privation B + barley germ concentrated technical D & L extract	33	39	41	46
9.	Privation B + same extract after treatment by fuller's earth	33	43	41	50
10.	Privation B + fuller's earth having been used for treatment of above extract	33	40	35	38

The main conclusions to be drawn from the study of the table are that the germinated barley insulinoide has no preventive action, nor any curative power on the rat during the latter's deficiency in vitamins B. The raw extract of barley germ does not give up an appreciable amount of vitamins B to the fuller's earth, which is classically the most energetic fixative of this vitamin. However, the trace of vitamin B that such a hydro-alcoholic extract may contain enables it, when deproteinized and concentrated to four-fifths, to prolong very slightly the life of the rats deprived of vitamin B. Therefore, the barley germ "insulinoide" is a substance different from vitamin B. The regulating power of this insulinoide on the metabolism of the carbohydrates, measurable by its hypoglycæmic action, is distinct from the action produced by vitamin B on the carbohydrates.

What are the conclusions to be drawn from the fact that the germinated barley insulinoide has an individuality perfectly distinct from that of a vitamin B? First of all, that the I.G.B. (insulinoide of germinated barley) does not act by its presence only, as would a vitamin. On the contrary, it acts the same as insulin, but in a more gentle and progressive manner. It is a hypoglycæmic agent, a curative of certain diabetic manifestations, improving very clearly the acidotic complications which so frequently accompany grave diabetes. Moreover, it is essentially easy to handle. Finally, we are led to

state that I.G.B. will have, to a more or less pronounced degree, the other actions of insulin on the general nutrition, all the while retaining the remarkable character of ease of handling which is proper to it.

Its use seems to be absolutely justified for fattening and hypokinesia cures. Of course, only long experience will tell if, while being much less dangerous to handle than insulin, insulinoïdes, and specially the I.G.B., will produce gently and continuously the desired effects on the recovery of the general nutrition. One of the most interesting facts verified clinically in regard to the use of the I.G.B., is precisely this rapid and striking effect on the improvement of patients' general condition. In diabetic patients this improvement coincides with the lowering of glycæmia, the disappearance of sugar, and the diminution of the signs and symptoms of acidosis.

REFERENCES

1. COLLIP, J. B.: Glucokinine, *J. Biol. Chem.*, 1923, 56: 513; *ibid.*, 57: 65; *ibid.*, 58: 163.
2. DURIN, H. E. AND CORRIET, H. B.: Isolation of a hypoglycæmia-producing principle from vegetables and nature of action of vegetable extracts on blood sugar of normal rabbits, *J. Metabolic Research*, 1923, 4: 89.
3. EISLER, M. AND PORTHEIM, L.: Über insulinartige Stoffe aus Bohren und deren Wirkung auf den Kohlehydratstoffwechsel, *Biochem. Zeitschr.*, 1924, 148: 566.
4. SHIKINAMI, Y.: Über die Hypoglykämie erzeugenden Stoffe aus Pflanzen und Mikroorganismen, *Tohoku J. Exp. Med.*, 1928, 10: 560.
5. KAUFMAN, E.: Insulinartige Pflanzenextrakte, *Berichte u. gesammte Physiol.*, 1926-27, 38: 151.
6. VON EULER, U.: Ein insulinartiger Körper in der Hefe, *Biochem. Zeitschr.*, 1928, 194: 197.
7. DONARD, E. AND LABBÉ, H.: Sur les propriétés hyperglycémiantes du maltose et de la mannite contenus dans les extraits de radiceles d'orge, avant et après fermentation, *Compt. rendu. soc. biol.*, 1933, 112: 1675.

CONGENITAL FAMILIAL CLUBBING OF THE FINGERS AND TOES*

BY FRANK L. HORSFALL, JR., M.D.,

*Resident Physician, Royal Victoria Hospital,**Montreal*

CLUBBING of the fingers and toes has been considered for centuries as one of the signs of definite organic disease, and is most commonly associated with chronic pulmonary or congenital cardiac lesions. That it may occur in the total absence of demonstrable intrathoracic abnormality has been known for decades, but the appearance of clubbing as a defect of congenital origin, unassociated with any definable organic cause, has only lately been observed. The familial tendency of this occasional congenital abnormality has been reported in only a few instances.

Von Eiselsberg,¹ in 1911, made the first report of congenital familial clubbing. His case was a male of thirty-five, whose father, sister, and uncle were known to have the same condition. Christian² has observed the abnormality in at least four families in Boston since 1914. Parkes Weber³ reported clubbed fingers and normal toes in twin brothers of twenty-five, who had an older brother with the same peculiarity. He states that in the year prior to his report he had examined a male of twenty-five whose fingers and toes were clubbed. This man's father, sister, and three brothers were similarly affected. Lewry⁴ described congenital clubbing of the fingers and toes in a girl of seventeen, but does not state that other members of the family showed the abnormality. Ragins and Freilich⁵ described the condition in a man of thirty-four. The father, sister, and parental uncle also had clubbed fingers. Kayne⁶ reported clubbing of the fingers and toes in a male of thirty-two whose father and one brother had the peculiarity.

Within the past year three adult male patients have been admitted to the wards of the Royal Victoria Hospital, one with hepatic cirrhosis, another with chronic rheumatoid arthritis, and another with a fracture of the skull, all of whom showed marked clubbing of the fingers and toes. In each instance these patients

stated that the clubbing had been present from birth. The family of the first patient contained a total of five members, in two generations, with congenital clubbing. The family of the second had in it ten persons, in four consecutive generations, with congenital clubbed fingers, and the family of the third, five persons in three generations, with congenital clubbing. Of this group of twenty persons it has been possible to thoroughly examine ten. In every case examined no organic lesion was found sufficient to account for the clubbing. Each of the affected persons has been definite in the statement that the abnormality had been present from birth.

CASE 1

D.K. (Medicine No. 66555, R.V.H.). A native-born Russian labourer of forty-eight, was admitted on December 16, 1933, because of cirrhosis of the liver, complicated by ascites and bleeding oesophageal varices. His symptoms were only of two weeks' duration, and he had been perfectly well beforehand. He denied all previous illness and stated definitely that he had not had chronic head colds, chronic nasal discharge, sinusitis, sore throats, bronchitis, chronic cough, or sputum. He also denied having had pleuritis, pneumonia, hæmoptysis, night sweats, or asthma. There had been no shortness of breath on exertion, no cyanosis, dyspnoea, palpitation, angina, or oedema. Physical examination revealed only moderate dental caries, mild chronic pharyngitis, and early arteriosclerosis, as well as marked abdominal enlargement, with ascites and engorgement of the superficial abdominal veins. No abnormal signs were found in the chest or heart. The spleen could just be felt, but the liver was not palpable. Blood pressure, 120 mm. Hg. systolic, and 75 diastolic.

The fingers were very markedly clubbed, those of the left hand somewhat more than those of the right. The nails were bilaterally curved and their distal ends were bent down over the finger tips. The nails of the left hand were considerably thickened, and all but that of the second finger were pitted and eroded from chronic onychomycosis. The toes were also clubbed, particularly the great and second toes. (See Figs. 1 and 2).

The urine was negative. Red blood cells 1,480,000; white blood cells 4,000; hæmoglobin 20 per cent. The Wassermann test was negative. The electrocardiogram showed left preponderance, but no other abnormalities.

Roentgenograms of the chest showed the heart to be normal in size and shape, the pleura at the right base to be slightly thickened, and the larger bronchial shadows to be mildly increased in intensity. Roentgenograms of the hands and feet showed slight broadening of the tips of the terminal phalanges, with numerous small indentations in those of the feet. There were medial osteophytes on the terminal phalanges of the great toes. The phalangeal enlarge-

* From the Department of Medicine, McGill University Clinic, Royal Victoria Hospital, Montreal.

ment was by no means sufficient to account for the clubbing, which appeared to be caused by changes in and thickening of the soft tissues (Fig. 3).

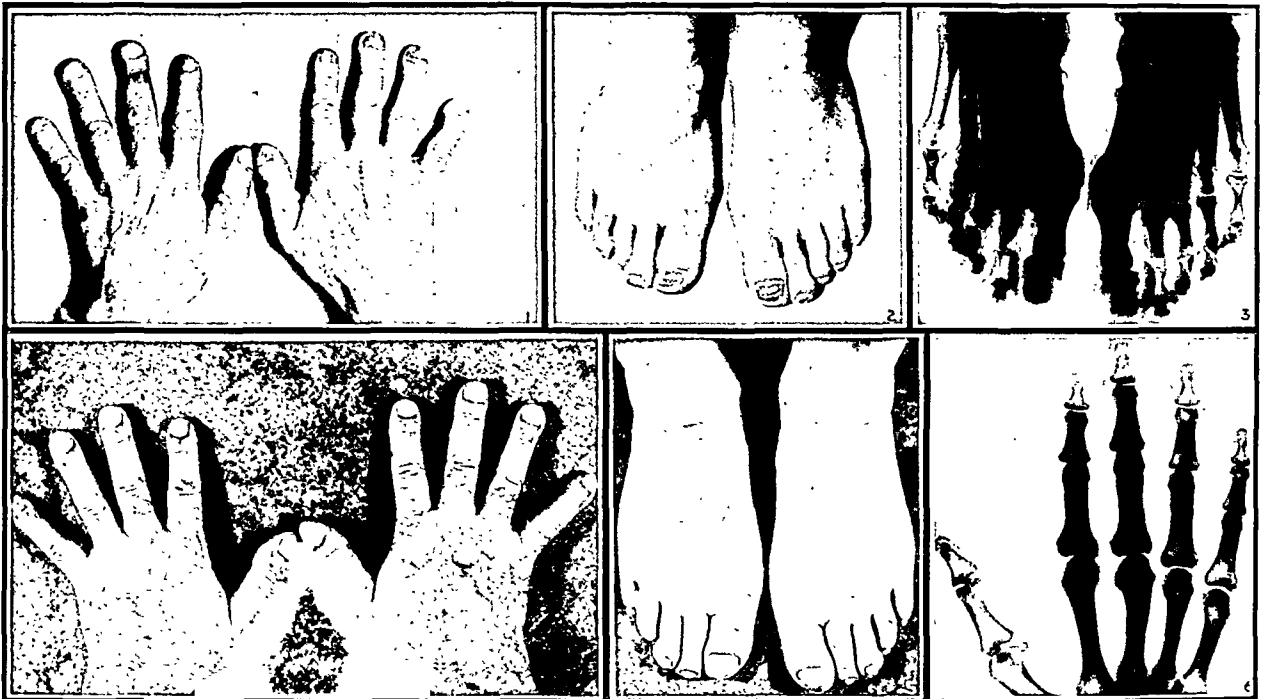
This patient's father, two sisters, and one brother were said to have clubbed fingers, which had been present from birth. The family is graphically presented in Chart I.

CASE 2

G.T. (Medicine No. 65257, R.V.H.). A native-born Italian labourer, of fifty-six, was admitted on June 20, 1933, with an acute exacerbation of chronic infectious arthritis affecting the right wrist, elbows, knees, and ankles. The arthritis commenced in 1929 and progressed with frequent exacerbations so as to incapacitate the patient about one-half of the time. Prior to its onset he had been perfectly well. He specifically denied previous bronchitis, pleuritis, and pneumonia, as well as head colds, sinusitis, epistaxis,

The urine was negative. Red blood cells 5,580,000; white blood cells 7,900; hæmoglobin 100 per cent. The Wassermann test was negative. The electrocardiogram showed left-sided preponderance, with a rare auricular extra-systole, but was otherwise normal.

Roentgenograms of the chest showed the heart to be moderately enlarged but not of abnormal shape. There was slight intensification of the hilar and bronchial shadows, but otherwise the lungs appeared normal. Roentgenograms of the hands and feet showed a mild "wheat shock", or very early "chestnut burr" appearance of the terminal phalanges, which was insufficient to account for the enlargement of the distal digital segments. The major portion of the enlargement or clubbing appeared due to an increase in the soft tissues. The osseous changes, although slight, were more prominent in the feet than in the hands, and in the great toes were associated with medial osteophytes at the bases of the terminal phalanges.



Figs. 1 and 2. Case 1.—Hands and feet showing clubbing of the fingers and toes. The second toes are more clubbed than the remainder. The nail lesions seen in the feet and left hand are the result of chronic onychomycosis. Fig. 3. Case 1.—Roentgenogram of the feet, illustrating the soft tissue increase in the terminal portions of the toes and the relatively slight osseous change. Figs. 4 and 5. Case 2.—Hands and feet illustrating the symmetrical and bilateral clubbing of the fingers and toes. Fig. 6. Case 2.—Roentgenogram of the left hand showing the increase in soft tissue in the clubbed fingers.

chronic nasal discharge, chronic cough, night sweats, sore throats, and asthma. He had not had shortness of breath on exertion, orthopnea, palpitation, precordial pain, edema, or cyanosis. Physical examination revealed a mild chronic pharyngitis, moderate pleural thickening at the left base, early peripheral arteriosclerosis, and moderate left-sided cardiac hypertrophy; otherwise the chest and heart were entirely negative. Blood pressure 142 mm. Hg. systolic, and 90 diastolic. There was chronic rheumatoid arthritis of the right wrist, elbows, knees, and ankles, as well as of the small joints of the feet. The small joints of the hands were unaffected.

The fingers were markedly clubbed. The nails were short and bilaterally curved, being convex dorsally in all diameters. The toes were also clubbed, particularly the great, second, and third toes. The toe nails showed an even more pronounced bilateral convex curvature than did the finger nails. (See Figs. 4 and 5).

CASE 3

C.F., a female of thirty-two, and the daughter of G.T., (Case 2). No physical signs of pulmonary disease or of cardiac abnormality were found. There was no history of cyanosis, cough, or dyspnea.

The thumbs were definitely clubbed, but the remaining fingers were quite normal in appearance. The feet showed slight clubbing of the second and fourth toes on both sides, while the other toes were normal, except for the small and shortened third toes. Roentgenograms of the chest showed the heart to be normal in size and shape, and revealed no pulmonary abnormalities. Red blood cells, 4,820,000; white blood cells, 6,000; hæmoglobin, 80 per cent.

CASE 4

M.F., a female of seven years, the granddaughter of G.T. (Case 2), and daughter of C.F. (Case 3). Physical examination revealed no signs of pulmonary or cardiac disease. There was no history of chronic cough, cyanosis,

or dyspnœa on exertion. The fingers and toes were all markedly clubbed, and the clubbing was of equal extent on both sides. Roentgenograms of the chest showed no cardiac or pulmonary abnormalities. Red blood cells, 5,100,000; white blood cells, 6,700; hæmoglobin, 90 per cent.

CASE 5

E.F., a female of five years, and the daughter of C.F. (Case 3). There were no signs of pulmonary or cardiac disease, and there was no history of cough, dyspnœa, or cyanosis. The thumbs and great toes were symmetrically clubbed, but the other fingers and toes appeared normal. Red blood cells, 4,950,000; white blood cells, 6,850; hæmoglobin, 88 per cent.

CASE 6

J.L., (Surgery, No. 88992, R.V.H.). A Jewish male of twenty-nine was admitted on April 30, 1934, with lacerations of the left scalp and right wrist, and a fissured fracture of the left frontal bone. These injuries had resulted from an automobile accident on the morning of admission. Except for a short period in January, 1925, when the patient was in hospital for acute gonorrhœal epididymitis, he had been perfectly well. He denied pleuritis, pneumonia, chronic cough, night sweats, and recent loss of weight. He had not had dyspnœa on exertion, palpitation, precordial pain, or cyanosis.

Physical examination showed a vertical laceration of the left forehead and scalp, exposing a fissured fracture of the skull. There was also a severe laceration of the right wrist. Otherwise the physical findings were essentially negative, except for marked symmetrical and bilateral clubbing of the fingers and toes, which he stated had been present all his life. The heart was not enlarged, and no murmurs were heard. Blood pressure, 120 mm. mercury, systolic, and 60, diastolic. No abnormal signs were found in the chest, and the liver and spleen were not palpable. The urine was negative. Red blood cells, 4,530,000; hæmoglobin, 86 per cent. The Wassermann test was negative.

A roentgenogram of the chest showed the heart to be of normal size and shape, and revealed no pulmonary abnormalities. Roentgenograms of the hands showed a moderate increase in the soft tissues of the terminal digital segments, but no associated osseous changes.

This patient's father, two sisters, and one nephew had definitely and symmetrically clubbed fingers and toes. All had possessed this abnormality since birth. Physical examination of these relatives failed to disclose cardiac or pulmonary abnormalities. Chart III is a graphic representation of this family.

In this series of cases the clubbing has uniformly taken the form of a distal digital drumstick, or club-like enlargement, which has been symmetrical and bilateral. In 2 of the 10 cases examined (Cases 3 and 5) only the thumbs and one or two of the toes were clubbed, while in the others there was clubbing of all the digits. Usually the thumbs and great toes have shown the most extensive clubbing, although in Case 2 the second toes were more affected than any of the other digits. The terminal phalanges have in most instances been somewhat short and were definitely increased in width.

In every case the clubbing appeared to be due to an increase in the connective tissues of the terminal segments, and although there were

associated slight bony changes, suggesting somewhat the "chestnut-burr" appearance seen in acquired clubbing, this was in no instance sufficient to account for the increase in size of the finger-tips. The most notable changes from the normal contour were quite constantly observed in the tissues between the nails and the terminal interphalangeal joints. At this site the skin appeared slightly raised over the underlying tissue, and was lightly stretched or tense, and quite smooth.

The nails were short and broad, often slightly thickened, and somewhat less transparent than normally. Many of the nails appeared more round than oval, and some were almost square, while all were convex upwards in every diameter. In a moderate number of instances there was a mild increase in longitudinal striation, but in no case was there transverse striation or grooving. Comparisons between the fingers of this group and the clubbed fingers associated with pulmonary tuberculosis, lung abscess, bronchiectasis, and congenital heart disease revealed no remarkable qualitative differences, except in so far as those of the latter group were occasionally cyanosed.

In the three families there was a total of 20 persons with congenital clubbing; 10 in family "T", 5 in family "K", and 5 in family "L", (Table I). In the first family the club-

TABLE I.
INCIDENCE OF CONGENITAL FAMILIAL CLUBBING AMONG
THE FIFTY-THREE MEMBERS OF THREE FAMILIES

	Families		
	"T"	"K"	"L"
Total members	25	21	7
Generations	4	3	3
Normal digits	6	4	0
Condition of digits unknown	9	12	2
Total with clubbed digits	10	5	5
Clubbing of all digits	8	5	5
Clubbing of some digits	2	0	0

bing was traced through four consecutive generations, and members were examined in three generations. In the second family the abnormality could be followed through only two generations, while in the third it had been observed in three generations. Charts I, II, and III are graphic representations of the three families. The total known membership of the three families was 53 persons, of whom 20 were known to possess clubbed fingers, and of these there were 10 with clubbed toes as well. Since

definite statements as to the condition of the digits could be obtained in but 30 of the total group of 53, it follows that of those about whom there is definite information some 66 per cent showed clubbing. If we assume the fingers and toes of the remainder to be normal, which may or may not be fair, the percentage incidence of clubbing in the entire group is still 37 per cent.

had the abnormality skipped a generation, to reappear in a second or third generation.

Once established, and in all instances here reported the abnormality had been present from earliest memory, the clubbing appeared to remain relatively fixed in degree. Neither those persons examined nor those relatives said to possess clubbed fingers had observed any pro-

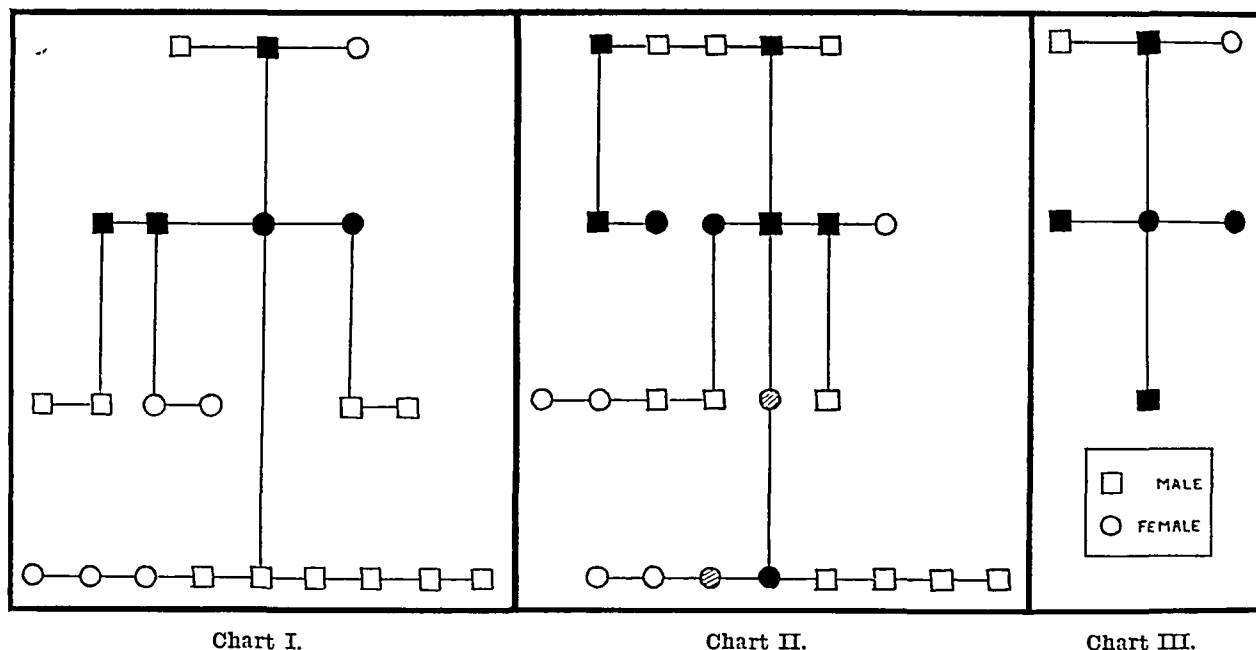


Chart I.—Graphic representation of family "K", showing members with clubbing. (Solid shading, clubbing of all fingers.) Chart II.—Graphic representation of family "T", showing members with clubbing. (Solid shading, clubbing of all fingers; striped shading, clubbing of some fingers.) Chart III.—Graphic representation of family "L", showing members with clubbing. (Solid shading, clubbing of all fingers.)

DISCUSSION

The clubbing characteristic, as exemplified by the twenty examples in the three families here reported, expressed itself in both male and female descendants. It was carried by both male and female parents, who themselves manifested the abnormality in greater or less degree. From this small series it may be assumed with some fairness that the characteristic is an inheritable abnormality, and, in genetic terms, is not sex-linked.

As to the relative dominance or recessiveness of the clubbing characteristic little can be said. Although there occurred in each of the three families one generation in which every member showed clubbing of all the fingers, the abnormality had not been consistently transmitted to the offspring. In two instances the offspring manifested clubbing in a considerably diminished degree, and only the thumbs and two or more of the toes were clubbed. In no instance

gression or retrogression in the extent of the abnormality shown by their respective fingers or toes. There had also been no increase or decrease noticed in the number of the digits so affected, and in the two cases in which merely the thumbs and two or more of the toes were clubbed these digits had remained as the only affected members.

Although individuals possessing congenital familial clubbing spontaneously appreciate that their fingers are not of normal appearance, they are caused no inconvenience by the abnormality. A history of increased sensitivity to heat or to cold, of pain, paræsthesiæ, or of any other subjective sensory abnormality could not be elicited in this group.

The average age of the twenty persons with clubbing was forty-six and two-tenths years. Three have died and their respective ages at death were 73, 70, and 21 years, the last having died of smallpox. The 17 still living had at-

tained an average age of thirty-eight and seventenths years, although three of this group were but 7, 5, and 2 years of age respectively. These figures seem to indicate that if congenital familial clubbing is the result of some more sinister underlying visceral lesion, which as yet has not been discovered, this of itself does not shorten life.

SUMMARY

A series of 20 cases of congenital familial clubbing of the fingers and toes is reported. The cases comprising this group were found in three families, of which one contained examples of the abnormality through four consecutive generations. The clubbing was not associated with discoverable visceral disease, and appeared to be an inheritable characteristic. It was transmitted by both male and female parents, and manifested itself in male and female offspring. The clubbing was symmetrical and bilateral, but did not always appear on all digits. In this series the thumbs were affected in every instance.

Congenital familial clubbing is compatible with a long and healthy life.

Despite its usual serious significance, clubbing of the fingers is not always a pathognomonic sign of severe visceral disease. The cases included in this series were found in the Royal Victoria Hospital during a period of one year. Congenital familial clubbing is not therefore the rare abnormality it has been considered, but is simply an unusual congenital characteristic which has no indirect diagnostic or prognostic importance.

I am greatly indebted to Professor J. C. Meakins for permission to include Cases 1 and 2, and to Dr. W. V. Cone for Case 6.

REFERENCES

1. VON EISELSBERG, A.: Ein Fall von multiplem unter dem Bilde von Trommelschlägelfingern einhergehendem Lymphangiom der Endophalangen, *Munch. Med. Wchnschr.*, 1911, 58: 1591.
2. CHRISTIAN, H. A.: Personal communication.
3. WEBER, F. P.: Occurrence of clubbed fingers in healthy persons as a familial peculiarity, *Brit. M. J.*, 1919, 2: 379.
4. LEWRY, E.: Beitrag zur Kenntnis der congenitalen Trommelschlägelfinger, *Med. Klinik.*, 1921, 17: 845.
5. RAGINS, O. B. AND FREILICH, E. B.: Familial congenital clubbing of fingers and toes; report of case, *Ann. Int. Med.*, 1933, 6: 946.
6. KAYNE, G. G.: Familial clubbing of fingers and toes, *Proc. Roy. Soc. Med.*, 1933, 26: 270.

RHINOSCLEROMA — WITH THE REPORT OF A CASE*

By P. E. IRELAND, M.D.,

Toronto

RHINOSCLEROMA is present in Canada so rarely that it is almost a medical curiosity. In reviewing the records of the Toronto General Hospital and the Department of Pathology one fails to find it recorded. In the literature there is no report of a case from Canada, although a few must have occurred. The purpose of this paper is to discuss this rare clinical entity and to report a recent case.

Etiology.—The clinical picture of this disease was first recognized by Heka in 1870, and the presence of Frisch bacilli, twelve years later. The disease, while rare here, is prevalent in the central European states, namely, Poland, the Ukraine, the Balkans and Hungary. Putschowsky¹ reports 500 cases from Kiev, the Ukraine. From here it has evidently spread to adjacent countries. Strangely enough, the disease has

been endemic in several isolated regions, notably, Sumatra and San Salvador. Esteban² has seen almost 300 native sufferers among the indigo workers of the latter state. In the United States 46 cases have been reported. Of these 5 were born in the United States, but 4 of them were of central European parentage. Lewis³ reports two native-born Mexicans who developed the disease. The rarity in the United States might be emphasized by noting that the diagnosis was made at Johns Hopkins only twice in thirty-two years, with 1,500,000 admissions. Canfield⁴ of Michigan, reports one of the American-born cases as the first in Ann Arbor, in 300,000 admissions.

The exact cause or factor responsible for the disease may be difficult to state. That it is hereditary is discredited by the investigations of Pjayak.⁵ The presence of the bacillus of Frisch, which seems almost identical with *B. mucosus capsulatus*, has been variously given as a secondary invader and as the causative organism. Animal experimentation with this organism has

* From the University of Toronto, Department of Oto-Laryngology.

Case presented at clinic for the American Laryngological, Rhinological and Otological Society, Toronto General Hospital, May 31, 1935.

been carried on in Europe. Sereer,⁶ of Jugoslavia, has been successful in producing typical pathological lesions in white mice by injections of cultures of the Frisch bacillus. From the animal lesions, the organism has been successfully recovered. Complement fixation is claimed by Tomasek⁷ to be present in about 83 per cent of the cases. Lewis³ states that he believes the high caloric and high carbohydrate diet of the Mexican may have been a large factor in his two Mexican cases. He places the causative factors under three possibilities: (a) constitutional predisposition; (b) diet deficiency with a nutritional unbalance; and (c) a mildly infectious factor. Figi and Thompson⁸ believe that rhinoscleroma is partly due to poor hygiene, and call it, the "disease of the great unwashed". They also agree that it is probably infectious, and quote one family, living in close quarters in Italy, in which fifteen members developed lesions.

Pathology.—The process is an indolent, infiltrating lesion. Organization develops and consequent fibrosis, with later deforming cicatrizations. It is a slowly progressive lesion, with the extensions apparently healing as they go. In the early stage there is transudation of fluid in the submucosa. This undergoes organization with a sparse round-celled infiltration. There are formed throughout the tissue fibrous bands with plasma-cell infiltration, the typical Mikulicz cells, and the hyaline bodies of Russel.

The Mikulicz, or "foam" cells, are not significant of rhinoscleroma, but are also found in leprosy, glanders, and bubonic plague. They are probably derived from the endothelial cell type, and appear like large, foamy, fat cells with peripheral nuclei. They are larger than the other cellular elements and about five times the size of a lymphocyte. Within these cells may be scattered, but never clumped as in leprosy, the Gram-negative rods or Frisch bacilli. The hyaline bodies of Russel are found scattered throughout and are the plasma cells showing hyaline degeneration.

As the lesions become older they show extensive invasion of areolar spaces, the newly formed, contracting fibrous tissue occupying the places of the former vascular and lymphatic channels. This interposition separates more and more the basement membrane from the nutrient vascular and lymphatic spaces.

Symptomatology.—The clinical symptoms may be divided into local and general, but the former are by far the more prominent. Early in the disease there are no general symptoms, but as it progresses gradual decrease in appetite and weight occurs, with loss of strength. When laryngeal obstruction begins the symptoms incident to this appear. Discomfort and irritation in the nose are the first local symptoms. Small oedematous nodules appear in the vestibule. As the pathological process progresses tenderness within the nose develops, and increasing fragility of the mucosa gives crusting and intermittent watery and even purulent secretion. A characteristic pungent odour, not unlike that of ozæna, is present at this time. Nasal obstruction develops with its consequent discomfort from mouth breathing and post-nasal discharge. The process extends backward to scar and disable the palate, and finally hoarseness develops from the laryngeal involvement. As the glottis is narrowed above and below, stridor and obstruction occur. Even following tracheotomy death may occur from extension to the lung.

Prognosis.—The lesion is a slowly progressive one, over a number of years, although occasionally self-limiting. It usually, after a period of 8 to 10 years, results in death from extension down the trachea into the lung, or even at a more early date if the laryngeal obstruction has not been relieved by tracheotomy. Recent reports from the use of radium and x-ray have been encouraging.

Treatment.—In 1915 Brummer and Jabowsky⁹ reviewed the treatments in vogue to that date. They summarized the use of mercury, arsenic, iodine, arsphenamine, tuberculin, and caustics, and concluded that they were all ineffectual. Vaccines seemed to lessen the extensions but had no effect on the sclerotic areas. In 1928 Figi and Thompson,⁸ of the Mayo Clinic, reported four cases treated with radium along with large doses of potassium iodide to loosen the secretions. They felt the early lesions could be cured and those further developed helped or arrested even when there was laryngeal involvement requiring tracheotomy. The treatment produces a limiting dense fibrosis in the affected areas. In 1932 Lewis³ advised a high fluid, protein and fat diet, with restricted carbohydrates. Combined with this is given a 14-day saturation with chlorides, alternating with shorter saturation with iodides and longer series of ascending doses of potassium

arsenite. He reported two cases with marked improvement in a year. In 1934 Canfield⁴ reported a case showing rapid improvement under radium and potassium iodide.

CASE REPORT

The patient was admitted to the Toronto General Hospital on February 25, 1935. Age 24 years.



Fig. 1.—L.P. section, Mallory stain, showing marked hyperplasia and fibrous tissue mass in subepithelial space. (a) Epithelial hyperplasia. (b) Fibrous tissue masses. Fig. 2.—H.P. section, hæmatoxylin and eosin, showing "foam cells" of Mikulicz, Russel bodies, with lymphocytic and plasma cell infiltration. (a) Mikulicz cells. (b) Lymphocytes. (c) Plasma cells. (d) Russel bodies. Fig. 3.—Oil-immersion section, Gram stain, showing organisms of rhinoscleroma (Frisch bacilli). These are Gram-negative, stain irregularly, and are grouped, not scattered as in leprosy.

He gave a history of nasal obstruction for 4 years; post-nasal discharge for 4 years; hoarseness for 3 years.

Present illness.—The patient first noticed nasal obstruction 4 years ago, which was bilateral and accompanied by a rather thick foul nasal discharge that was never blood-stained. At this time he had his tonsils and adenoids removed with no improvement to the symptoms. Three years ago he first noticed hoarseness. This and the nasal obstruction have been getting progressively worse since that time. About two years ago an ethmoidectomy and a partial resection of both middle turbinates was done. This gave only temporary relief to the nasal obstruction and the hoarseness continued. For the past year he had had difficulty in doing his work. This was due in part to general debility but for a few weeks previous to admission, to shortness of breath. He had lost fifteen pounds in weight during the past eight months, with no cough or digestive symptoms, except a rather poor appetite. His difficulty in breathing had become a real wheezing stridor on the slightest exertion, and his voice was almost entirely gone.

Personal history.—Born in Poland, he came to Canada at the age of fourteen years. He had been employed as a lumberman and in road construction.

Past history.—Of no importance.

Family history.—No history of tuberculosis or malignant disease could be obtained, nor of similar symptoms occurring in any of his relatives.

Physical examination.—The patient was a rather undernourished white male suffering continuous moderate dyspnoea, with an inspiratory stridor. A long coarse inspiratory rhonchus was heard over the trachea and throughout all of the chest. The heart was normal in size, the sounds of good quality and with no murmurs. There were no signs of failure present. Blood pressure 125/86. The abdomen and nervous system were negative.

Special examination.—There was a penetrating odour from the patient's nose and throat, not unlike that found in cases of atrophic rhinitis with ozæna. The septum of the nose was deviated to the left. The whole of the anterior vestibule showed scarred thickening with the floor of the nose apparently at a higher level than normal. There was crusting and purulent discharge on both sides of the nose and evidence of a partial resection of both middle turbinates. The remaining portions of the turbinates were very thick, with fibrous adhesions on the left to the septum and unciform process. On pressure the involved areas were quite tender. Transillumination showed all the sinuses to be dim but about equally illuminated. The tonsils had been removed, with considerable scarring of the pillars. The nasopharynx and the soft palate showed marked scarring. The uvula was turned behind the palate by scar tissue. The posterior nares could not be seen. The pharynx was granular, but very little scar tissue was to be seen.

The larynx was difficult to see because of a small thick epiglottis that seemed folded over the glottis. The whole larynx seemed smaller than normal and partially filled in with thick redundant tissue. The cords could not be seen, but the right arytenoid was apparently completely fixed and the left limited in its movements.

Examination of the ear was entirely negative.

An attempt was made to view the larynx by the Jackson laryngoscope, but dyspnoea became so acute that an emergency tracheotomy was necessary. A portion of the third tracheal cartilage was removed and marked thickening of the mucous membrane of the trachea was found at and above this point. No further examination was done.

Eight days later, under ether, direct laryngoscopy was performed and tissue was removed for biopsy from the larynx and nasal mucosa. The exposure of the glottis was very difficult on account of the overhanging fibrosed epiglottis. The area above the true cords seemed to be narrowed and filled by a firm mass. No ulceration and no outcropping were seen. The subglottic area showed

a uniform, smooth, circular thickening that added to the general laryngeal obstruction. Biopsy specimens were taken from the masses above the vocal cords and from the vestibule of the nose and the left middle turbinate.

Laboratory findings.—Hæmoglobin, 90 per cent. White blood cells, 8,900 (polymorphonuclears, 80 per cent; lymphocytes, 17 per cent; endothelials, 3 per cent) no immature cells were seen. Urine was negative. Blood Wassermann test, negative. Calcium (serum), 12.2, when repeated, 12.0 mgm. X-ray of the sinuses was negative, except for some thickening in the ethmoid region.

Pathological report.—Tissue from the nose—rhinoscleroma. Tissue from the larynx—chronic inflammation. The laryngeal biopsy showed bands of fibrous tissue running through the tissue, but the characteristic cells were absent. This was due probably to the fact that the sections were not sufficiently deep.

Bacteriological findings.—*Bacillus mucosus capsulatus* was the predominating organism, although *Streptococcus viridans* and *Staphylococcus albus* were also present.

Treatment.—The patient was placed on a low carbohydrate, high fat and protein diet. After 6 weeks the carbohydrate was raised because of loss of weight. Potassium iodide was given up to saturation in series. Radium therapy was instituted by means of a 4 g. teleradium bomb. This was applied to the nose over three portals by cross-firing, with a total dosage of 2500 R. units and a cumulative dose of 1660 r. The throat and larynx were treated by two portals with a total dosage of 3612 r. and cumulative one of 2714 r. The nose became much clearer with apparent regression of the lesions. The larynx showed very little change, and 4 months later it was still impossible to do without the tracheotomy tube.

SUMMARY

1. A typical case of rhinoscleroma has been reported.
2. The disease, while rare in Canada, should be kept in mind in the case of obscure upper respiratory lesions.
3. In the absence of treatment the lesion is progressively fatal. Early cases may respond to radium therapy.

REFERENCES

1. PUTSCHOWSKY, A.: Changes in the organism accompanying scleromata, *Acta Otol. Laryngol.*, 1929, 32: 543.
2. ALDERSON, A.: Rhinoscleroma, *Arch. Dermat. & Syph.*, 1932, 26: 639. (Discussion by Dr. Esteban, San Salvador).
3. LEWIS, E. R.: Clinical report two cases of rhinoscleroma, *Trans. Am. Laryngol., Rhinol. & Otol. Soc.*, 1932, 38: 459.
4. CANFIELD, N.: Case of rhinoscleroma in a native-born American, *Ann. Otol., Rhinol. & Laryngol.*, 1933, 42: 903.
5. PJAYAK, PROF.: *Ukrainische med. Nachricht*, (reviewed by A. Putschowsky), *Acta Otol., Laryngol.*, 1929, 32: 543.
6. SERGER, A.: Rhinoscleroma in white mice, *Acta Otol., Laryngol.*, 1928, 13: 23.
7. TOMASEK, V.: Complement fixation in rhinoscleroma, *Abstr. J. Am. M. Ass.*, 1924, 82: 2000.
8. FIGI, F. A. AND THOMSON, L.: Rhinoscleroma, *J. Am. M. Ass.*, 1928, 91: 637.
9. BRUMMER AND JABOWSKY: (reviewed from E. R. Lewis), *Trans. Am. Laryngol., Rhinol. & Otol. Soc.*, 1932, 38: 459.

THE IMPORTANCE OF EARLY DIAGNOSIS IN MYCOTIC DISEASES, WITH SPECIAL REFERENCE TO BLASTOMYCOSIS

WITH A BRIEF REPORT OF TWO CASES

BY PAULINE BEREGOFF-GILLOW, PH.G., N.S., M.D.,*

Montreal

IN the temperate zones mycotic diseases often pass unrecognized. There is no doubt that many cases abandoned as resistant to the treatment for supposed tuberculosis, syphilis or chronic suppuration, in which the specific organism was not found, were in reality mycotic affections that could have been cured by iodine therapy. It is essential that ulcerations or suppurations and the clinical manifestations of possible tuberculosis or syphilis, and any other skin or general affection should not be considered as diagnosed with certainty, unless either the microorganism or the specific serum reactions

prove the case to be of such etiology, for many of the mycotic diseases closely simulate the multiple foci of tuberculosis, syphilis and other chronic suppurations.

Fungi, like tubercle bacilli, may invade every part of the body. They may attack articular or osseous tissue, penetrate the teguments, and cause multiple abscesses which ulcerate or become absorbed; they may become secondary invaders of skin lesions, of the oral cavities, and, in fact, may localize and adopt a parasitic life in any part of the body. The most common seat they select, however, is the lung. Howes and Morse¹ state that the lungs were found to be involved in 97 per cent of the cases that came to autopsy. Castellani² reported a number of cases of pulmonary lesions from which he isolated different types of fungi, and Ferguson³ states that mycotic lesions of the lungs are as common

* Formerly Director of Experimental Medicine of Santa Clara Hospital and Professor of Pathology and Parasitology in the University of Cartagena, Colombia, S.A.

From the Department of Laboratories, the Woman's General Hospital, Montreal.

as tuberculosis and that the two are often associated.

In tropical countries, as well as in the more temperate latitudes, fungi of the order Saccharomycetes are the most commonly found. During a period of many years in the tropics I had the opportunity of studying many types of mycotic lesions, cutaneous as well as generalized, the most frequent of which were of the blastomycetic origin. I recall one case in particular, a physician, while on a tour of the United States and Europe, had been examined in leading clinics, where a diagnosis of pulmonary tuberculosis was made. Cervical glands were removed and animal inoculations from the tissue as well as the sputum were made, and even though the result was negative they based their diagnosis on typical clinical findings. On his return to the tropics we obtained cultures from the exudate of the incised glands which were still draining. A pure culture of *Blastomyces* was obtained. Large doses of potassium iodide cleared the condition completely. On my recent visit to the tropics I saw the patient who is in excellent health.

It appears from the literature that at present mycotic affections are no longer a rarity in the temperate zones. We are beginning to realize more and more that the fungi have as natural an habitat here as in the tropics, yet I believe that there are still many cases where we fail to make the diagnosis, simply because the laboratory workers are not trained to search in that direction, believing that mycotic diseases pertain to the tropics. In 1929, while at the Traverse City State Hospital, I reported a case⁴ of renal actinomycosis which would have been completely ignored if I had not, by mere chance, been present while a urinary sediment was being examined.

A review of the literature of blastomycosis in Canada reveals that this affection is far from uncommon. Gillies,⁵ from the Manitoba Sanatorium, reported an interesting case of generalized blastomycosis which simulated tuberculosis. The leg was the seat of the primary lesion, which was diagnosed by x-ray, as well as by biopsies, as tuberculous osteitis, even though the tubercle bacilli were never found. The patient had a cough, and was beginning to present symptoms of a generalized infection, when a more careful search of the sputum and pus from the abscesses resulted in the correct diagnosis and

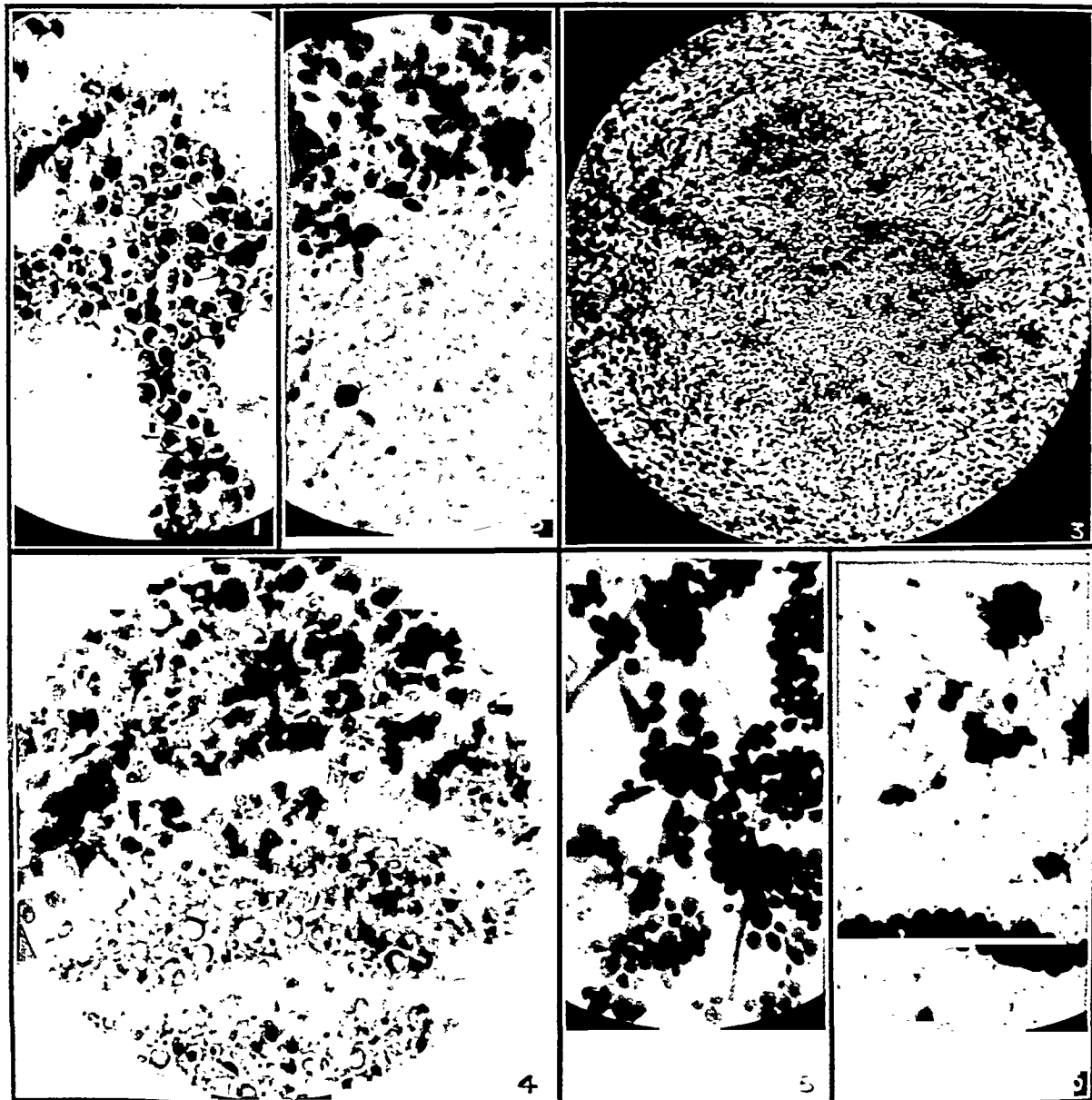
the patient was saved. Aubrey Crich,⁶ of the Lockwood clinic, reported a case of blastomycosis of the gingiva and jaw which is of great interest to the dental profession. This case recalls to my mind two cases of blastomycosis of the antrum, with necrosis of the bone. Hanford McKee,⁷ of Montreal, gave a very complete description of a case of blastomycosis of the eyelid and face, while Shepherd and Rhea⁸ reported one case from the Montreal General Hospital. An exceedingly interesting case is recorded by Gaumond,⁹ of the Hôtel-Dieu, that of a child of 11 years who attended that hospital off and on for over a year. The patient presented general debility and a temperature ranging between 99 and 102° F. Abscesses that appeared on the temporal region and over the posterior left costovertebral area were thought to be of tuberculous origin, since the x-ray findings of the lungs indicated tuberculosis. Neither the sputum nor the pus from the abscesses showed the tubercle bacilli. The child died and at autopsy every organ showed multiple abscesses, the pus of which was cultured in sugar media and the fungi recognized. No tuberculous infiltration was found. Doctor Gaumond admits that it never occurred to them to suspect a mycotic disease, and from his experience a lesson is to be learned.

Recently I found fungi of the order Saccharomycetes in the sputa of two patients from the medical service of the Woman's General Hospital. One of the sputa was sent for Neufeld typing, as x-ray findings indicated a pneumonia. The typing with No. 1, 2 and 3 sera was negative. A stained preparation (Fig. 1) showed many roundish and oval cells, some budding, showing a double contour and a definite, well-defined membrane. The presence of granules in the protoplasm was noted. At my request a bronchoscopic examination was done to obtain a specimen for culture, which showed a pure growth of the organism (Fig. 2). The growth on glucose agar of this organism was luxuriant, smooth and white, consisting of round and oval cells, some budding without any mycelium. The diameter of the cells was about 3 to 7 microns. The organism fermented all sugars, having the characteristics of the genus *Blastomyces*. Guinea pigs and rats were intravenously inoculated with a culture of this organism and after three weeks were killed. Practically all the organs showed multiple abscesses, and the lungs especially were

studded with white nodules resembling tubercles (Fig. 3, low power). On section one notes (Fig. 4, high power) a central area of necrosis containing typical double-contoured roundish fungal cells, many polymorphonuclear leucocytes and red blood cells, surrounded by granulation tissue and giant cells.

The second sputum sent for investigation for tuberculosis aroused interest owing to its peculiar

attention. On pressure with a spatula, however, a greyish cheesy material was expressed, which when examined under the microscope showed the same fungi as the sputum and the scrapings of the tongue. The growth of this organism in glucose agar was abundant, white and smooth. It produced no gas in any of the sugar media, unlike the first described, which fermented all sugars. Only slight acid production in glucose



colour, which was almost black. No tubercle bacilli were found, but instead an abundance of budding, as well as single, cells presenting a double contour and many small thalli (Fig. 6). On examining the mouth of the patient (female), the tongue was coated with a thick greyish membrane, as also were the papillæ, which were greatly hypertrophied. The tonsillar fossæ were congested, but, superficially, would attract no

was noted. Asci were not observed, and but little mycelium was present in liquid media. The cells were smaller than in the previous case and the granules in the protoplasm were not so marked (Fig. 5). This organism gave the cultural characteristics of the genus *Cryptococcus*, and resembled the organism isolated by Castellani¹⁰ in 1925 in a few cases of macroglossia, and which he named *Torulopsis macroglossia*.

DISCUSSION

To the mycotic diseases belongs the peculiarity that the same affections are produced by different species of fungi, and that the lesions produced are seldom so characteristic as to permit a clinical diagnosis without the aid of the microscope. Moreover, the morphology of the fungi is such that the study of the organisms in a normal saprophytic environment (a culture medium) is often necessary for their identification. The fungi are commonly saprophytes, but occasionally adapt themselves to a parasitic life, depending a great deal on the environment. Their life-history, therefore, is of great importance practically as well as scientifically, because, as in the case of many other infections, especially the parasitic, a proper medium is necessary for the growth and multiplication of the parasite. Trauma, ulcerations, lesions of tuberculous or syphilitic origin, or any constitutional disorder, such as diabetes, are predisposing factors for the development of mycotic lesions. The essential transmitters of the mycelium or spores of the fungi are food in disintegration, water and air, but, occasionally, they may be transmitted by mosquitoes, fleas, bedbugs, etc. Considering the life-history and the mechanism of transmission it is absurd to think that in this country mycotic

diseases are a rarity. The sooner we realize this and teach the laboratory workers the importance of recognizing the fungi, the more cases we will find of this infection, and the proper treatment be given in time. These affections are easily cured by iodine, if treated early.

SUMMARY

Two cases of blastomycosis are added to the Canadian literature.

A description of the organisms isolated, with their cultural characteristics and the result of animal inoculations, is given.

Stress is laid on early recognition and treatment.

REFERENCES

1. HOWES, W. B. AND MORSE, P. F.: Report of two cases of blastomycosis, *Boston M. & Surg. J.*, 1921, 185: 315.
2. CASTELLANI, A.: Notes on blastomycosis; its etiology and clinical varieties, *Proc. Roy. Soc. Med.*, 1928, 21: 1, 446. *Ibid.*: Fungi isolated from cases in North America and Europe; *J. Trop. Med.*, 1933, 36: 297.
3. FERGUSON, A. S.: Blastomycosis of the eye and face secondary to lung infection, *Brit. M. J.*, 1928, 1: 442.
4. BEREGOFF, P.: Renal actinomycosis with special reference to urinary findings: report of case, *J. State Med. Soc. Michigan*, 1929, 28: 383.
5. GILLIES, M.: A case of blastomycosis, *Canad. M. Ass. J.*, 1933, 29: 183.
6. CRICH, A.: Blastomycosis of the gingiva and jaw, *Canad. M. Ass. J.*, 1932, 26: 662.
7. MCKEE, H.: Blastomycosis of the eye, *Canad. M. Ass. J.*, 1930, 22: 501.
8. SHEPHERD, F. J. AND RHEA, L. G.: A fatal case of blastomycosis, *J. Cutan. Dis.*, 1911, 29: 588.
9. GAUMOND, E.: Blastomycose généralisée mortelle, *Bull. Soc. Méd. d. Hôp. Universitaires de Québec*, 1933, 34: 322.
10. CASTELLANI, A.: Three new yeastlike organisms and a new bacillus, with remarks on clinical conditions from which they have been isolated: *Furunculosis blastomycetica*; *Macroglossia blastomycetica*; *Stomatitis cryptococcica*, *J. Trop. Med.*, 1925, 28: 217.

HÆMOGLOBIN OF NORMAL CHILDREN AND CERTAIN FACTORS INFLUENCING ITS FORMATION*

By JOHN R. ROSS AND PEARL SUMMERFELDT

Toronto

COMPARATIVELY few determinations of the hæmoglobin content of normal children have been reported.^{1 to 6} The results given vary widely, depending on the method used, the social status of the children, and the time of year. On account of the wide variation reported we have determined the hæmoglobin by the Newcomer method on four groups of normal children. The first group consisted of 77 boys, 11 to 14 years of age, from business and professional

homes, who were day pupils attending a private school. In the second group there were 151 boys and girls, 5 to 14 years of age. These children were from average homes of the working class. The third group comprised 30 boys, 10 to 14 years of age, who were living in an institution in the city, and the fourth group consisted of 72 boys and girls from 5 to 14 years of age who were living in an orphanage in the country.

In Chart 1 are seen the results of the hæmoglobin determinations. The children were divided into two age groups, from 5 to 10 years and from 10 to 14 years. It is seen that the hæmoglobin of the older children was slightly higher than that of the younger ones living under the same conditions. The children from

* From the Nutritional Research Laboratories of the Department of Pædiatrics, University of Toronto, and the Hospital for Sick Children, Toronto, under the direction of Alan Brown.

Read at the 13th Annual Meeting of the Canadian Society for the Study of Diseases of Children, East Aurora, N.Y., June 1, 1935.

daily intake by 9 mg. Hæmoglobin determinations were made monthly on all the children by the Newcomer method. The hæmoglobinometer used was standardized by the Van Slyke oxygen capacity method. Red blood counts made on a number of the children varied from 4,240,000 to 6,010,000 per c.mm. of blood. The average increase in the hæmoglobin of each group during the entire period of 19 months is shown in Chart 3.

At the end of the first 7 months (Period 1 in the chart), the control group showed no appreciable increase in hæmoglobin. The second group, receiving the same diet with added vitamin B complex concentrate, showed an average increase in hæmoglobin of 0.7 g. per 100 c.c. of blood, while the third group, receiving the additional iron and copper furnished by the special

cereal mixture, showed an average increase of no less than 1.6 g.

At the beginning of the second period of 7 months in both the control group and the vitamin B concentrate group the amount of iron and copper was increased by replacing the ordinary cereal with the same amount of the special cereal mixture. The vitamin B concentrate was omitted. It is seen that the hæmoglobin of both these groups increased rapidly. The original special cereal group showed no further increase in hæmoglobin.

At the beginning of the third period the amount of iron received by the original special cereal group was further increased by 9 mg. daily through increasing the iron content of the special cereal. It is to be noted that the average hæmoglobin of this group showed a further

SPECIMEN MENU
MARJORY DEW, AGED 9 YEARS

<i>Date</i>	<i>Breakfast</i>		<i>Dinner</i>		<i>Supper</i>		<i>Recess Milk</i>
1935 Feb. 1	Oatmeal Bread Butter Milk	<i>Grams</i> 282 102 19 102	Eggs (2) Potatoes Pudding (cottage) Sauce	<i>Grams</i> 94 294 65 104	Scalloped vegetables mixed, consisting of beans, car- rots, potato and turnips Bread Butter Milk	<i>Grams</i> 224 101 20 184	
Feb. 2	Oatmeal Bread Butter Milk	272 85 17 227	Beef heart Potatoes Shredded cabbage Shredded carrots	31 164 42 42	Bread Peanut butter Milk Cake	127 40 222 62	
Feb. 3	Bread Butter Milk Cornflakes Orange	157 15 184 18 128	Headcheese Beets Bread Butter Pie (mince meat)	64 180 42 15 78	Raisin bread Milk Butter	150 219 36	
Feb. 4	Bread Butter Oatmeal Milk	80 14 272 220	Beans Tomatoes Beef Bread and butter pudding with raisins	202 100 44 340	Baked potatoes Bread Butter Milk	245 83 12 224	
Feb. 5	Oatmeal Bread Butter Milk	268 70 11 220	Hot scones Minced meat (beef) Raw carrot salad	108 252 92	Bread Butter Cocoa Cake	119 20 393 110	131 g.
Feb. 6	Oatmeal Bread Butter Milk	254 73 10 204	Potatoes Irish stew, consisting of onions, turnips and carrots Beef Bread pudding	182 283 102 246	Bread Mutton broth Butter Cocoa	101 398 12 446	234 g.
Feb. 7	Bread Butter Oatmeal Milk	80 11 332 260	Lettuce Beef minced Potatoes Carrots Tapioca pudding with eggs and milk	39 113 185 105 275	Bread Currant jam Milk	143 72 220	204 g.

increase during the succeeding 5 months of 1.1 g. per 100 c.c. of blood. In the other two groups at the beginning of the third period the iron and copper intake was reduced by replacing the special cereal used in period two by an equal amount of ordinary cereals. The hæmoglobin of both these groups dropped markedly, as shown in the chart.

In Chart 3 it will be seen that children of the orphanage class on a diet adequate according to present day dietary standards, and containing an average iron content of 11 mg. in the daily intake, showed no increase in hæmoglobin. When the ordinary cereals in this supposedly adequate diet were replaced by an equal amount of a special cereal mixture which, in addition to increasing the iron and copper content of the diet, contained an extra amount of vitamin B complex, a large increase in hæmoglobin occurred. Certain observers¹² have shown that when vitamin B complex is added to a diet an increase in hæmoglobin is obtained through better utilization of iron. However, in period 1, when a vitamin B concentrate containing a greater amount of the vitamin B complex than that contained in the special cereal was added to the control diet, only a moderate increase in hæmoglobin was obtained. From this it follows that the increase in hæmoglobin obtained when the special cereal mixture was added to the supposedly adequate diet was due largely to the iron or iron and copper content of the special cereal rather than to the vitamin B complex. We still do not know the optimal level of iron intake for children, since the addition of 9 mg. of iron daily to the previous daily intake of 27 mg. produced a further increase in the hæmoglobin.

SUMMARY

1. The hæmoglobin content of the blood of normal children is lower than the accepted adult standards and varies with the age and economic status of the child.

2. The addition of an iron- and copper-free vitamin B complex concentrate to a diet considered adequate according to our present dietary standards resulted in a moderate increase in the hæmoglobin content of the blood of normal children.

3. The substitution of an iron- and copper-rich cereal mixture, containing vitamin B complex for the ordinary cereals contained in a diet considered adequate according to our present dietary standards, resulted in a marked increase in the hæmoglobin content of the blood of normal children.

4. A further increase in the iron content of this special cereal mixture, bringing the children's daily intake of iron to 36 mg., produced a still further increase in the hæmoglobin content of the blood.

5. The optimal iron intake for hæmoglobin formation in normal children is greater than the present accepted standards.

REFERENCES

1. SOBEL, I. P. AND DREKTER, I. J.: Determination of the iron content of the blood in children, *Am. J. Dis. Child.*, 1933, 45: 486.
2. GIBBS, N.: Diagnosis and treatment of anaemia in school children, *The Lancet*, 1929, 2: 550.
3. KERSHAM, M. AND FREEMAN, M. D.: A study of hæmoglobin methods, *J. Lab. & Clin. Med.*, 1929-30, 15: 74.
4. DAVIDSON, L. S. P., FULLERTON, H. W., HOWIE, J., CROLL, J., ORR, J. B. AND GODDEN, W.: Observations on nutrition in relation to anaemia, *Brit. M. J.*, 1933, 1: 685.
5. GOLDHAMER, M. AND FRITZELL, A.: A study of the red blood cell count and hæmoglobin in the adolescent male, *J. Lab. & Clin. Med.*, 1934, 19: 172.
6. WILLIAMSON, C. S.: Influence of age and sex on hæmoglobin: a spectrophotometric analysis of nine hundred and nineteen cases, *Arch. Int. Med.*, 1916, 18: 505.
7. OSGOOD, E. E. AND HOSKINS, H. D.: Relation between cell count, cell volume and hæmoglobin content of venous blood of normal young women; redeterminations of colour index, volume index and saturation index standards, based on observations in one hundred cases, *Arch. Int. Med.*, 1927, 39: 643.
8. WINTROBE, M. M. AND MILLER, M. W.: Normal blood determinations in the south, *Arch. Int. Med.*, 1929, 43: 96.
9. HADEN, R. L.: The normal hæmoglobin standard, *J. Am. M. Ass.*, 1922, 79: 1496.
10. TISDALL, F. F., DRAKE, T. G. H. AND BROWN, A.: A new cereal mixture containing vitamins and mineral elements, *Am. J. Dis. Child.*, 1930, 40: 791.
11. ROSS, J. R. AND SUMMERFELDT, P.: Value of increased supply of vitamin B1 and iron in the diet of children. (Paper II), *Am. J. Dis. Child.*, 1935, 49: 1185.
12. KYER, J. L. AND BETHELL, F. H.: The vitamin B complex and nutritional anaemia in the white rat, *Proc. Am. Soc. Bio. Chem.*, 29th Annual Meeting, April 10, 1935.

DIAGNOSTIC SIGNS OF BELL'S PALSY AND GRAVES'S DISEASE.—H. Cohen reports two new eye signs. If a patient with Bell's palsy in the early stage, or late in the recovery stage, is told to "look upwards but keep the eyes closed" any weakness of the orbicularis palpebrarum will allow the eye to be opened by the stronger contraction of the levator palpebrae superioris. The other

sign is a third component of the convergence-accommodation reflex—namely, relaxation of the levator palpebrae superioris, with consequent lowering of the upper eyelid. Cohen states that loss of this third component is one of the earliest ocular signs in chronic encephalitic Parkinsonism and in hyperthyroidism.—*Brit. J. Ophthalmol.*, May, 1935, p. 267. Abs. in *Brit. M. J.*

POST-ANÆSTHETIC LEUCOCYTOSIS*

BY ELDON M. BOYD,

Kingston, Ont.

ANÆSTHESIA produces in man a leucocytosis which occurs independently of any concomitant surgical procedure. The extent, nature and duration of the leucocytosis are of paramount importance to the proper appraisal of white cell counts taken a few hours to a few days after operation. Previous studies of this phenomenon have been confined entirely to the elaboration of histological details and factors which affect them. The present contribution is a continuation of chemical studies on the blood leucocytes, and is concerned with the effect of anæsthesia upon the lipid composition of the white blood cells.

According to Rieder the honour of discovering the leucocytosis of anæsthesia goes to Claude Bernard, Meyer and Siegen, who found that the internal administration of ether resulted in an increase in the white cell count. Da Costa examined 27 cases in 1895, but his results were not conclusive because most of his cases had had a leucocytosis before the anæsthetic was given and little change in the count was effected thereby. Undoubtedly the credit for definitely establishing the essential features of the leucocytosis of anæsthesia belong to Alfred von Lerber,⁶ a Swiss, who presented his results in his Inaugural-Dissertation at Bern. Von Lerber investigated 101 cases before and after ether anæsthesia, and found that the white cell count became increased in 96 and decreased in 5. In 35 of the 96 cases the count was doubled by anæsthesia and in 23 it was tripled. In 3 of the 5 cases in which he failed to demonstrate a leucocytosis infection had been present before operation. The leucocytosis began to appear within a few minutes of the induction of anæsthesia, reached a maximum in about three hours, and disappeared in one to six days, providing that there was no post-operative infection. Differential white cell counts were then unknown (one common belief was that the lymphocyte was a younger type of polymorphonuclear cell!)

but von Lerber made the prophetic observation that there were many "*mehrkernigen Leukocyten*".

Since von Lerber's publication many painstaking studies of the blood leucocytes following anæsthesia have been made, but relatively little new information has been added. In 1899, Chadbourne⁴ proved that the leucocytosis was due to the anæsthetic and not to the surgical interference. In 1900 White¹² extended von Lerber's work by showing that the polymorphonuclear cells were responsible for the increased white cell count, and Stahl¹⁰ in 1922 demonstrated that the new granulocytes emptied into the blood stream contained many stab cells and younger forms. Other investigators have confirmed these findings, showing that the leucocytosis occurs after anæsthesia in all types of operations including parturition. Factors increasing the extent of the leucocytosis have been shown to be hæmorrhage, the length of the anæsthesia, and the severity of the traumatization. Ether has usually been found to cause a greater leucocytosis than other narcotics.

Many experiments have been performed upon animals and the results applied with all too little reservation to the human subject. Only in recent years has the importance of species variation become generally appreciated. The point is well taken in the present instance. Anæsthesia has been almost unanimously found to cause a leucocytosis in dogs, although an earlier investigator (Pohl) recorded but little effect. In rabbits, Leake⁷ and Ewing² reported a narcotic leucocytosis usually of slight extent, while Rosenow⁸ and Stier and Levey¹¹ recorded a leucopenia in many instances. Cats also exhibit a leucopenia following narcosis, according to Schweizer.⁹

To return to the human subject, it has been shown that following narcosis by various agents there occurs within a few minutes a mobilization into the circulating blood of many polymorphonuclear leucocytes, containing amongst their numbers a goodly proportion of young

* From the Department of Pharmacology and Therapeutics, Queen's University, and the Richardson Laboratories, Kingston General Hospital.

cells. Since this leucocytosis reaches a maximum within three to four hours it is likely that these additional cells have migrated into the blood from the liver, spleen, bone marrow and other tissues where they were previously lying dormant, stored, or functioning in some subsidiary rôle. Insufficient time has elapsed for the production of new leucocytes. Microscopically, the resulting leucocytosis cannot be distinguished from that in fever or infection.

type of operation was not found to affect the results, confirming similar previous conclusions relative to the white cell count. Anæsthesia was maintained by inhalation of ether following induction by either chloroform or nitrous oxide. Morphine and atropine were given routinely before operation. The white blood cells were separated from samples of about 50 c.c. of blood, ground with cleaned sand and extracted with alcohol-ether after the manner

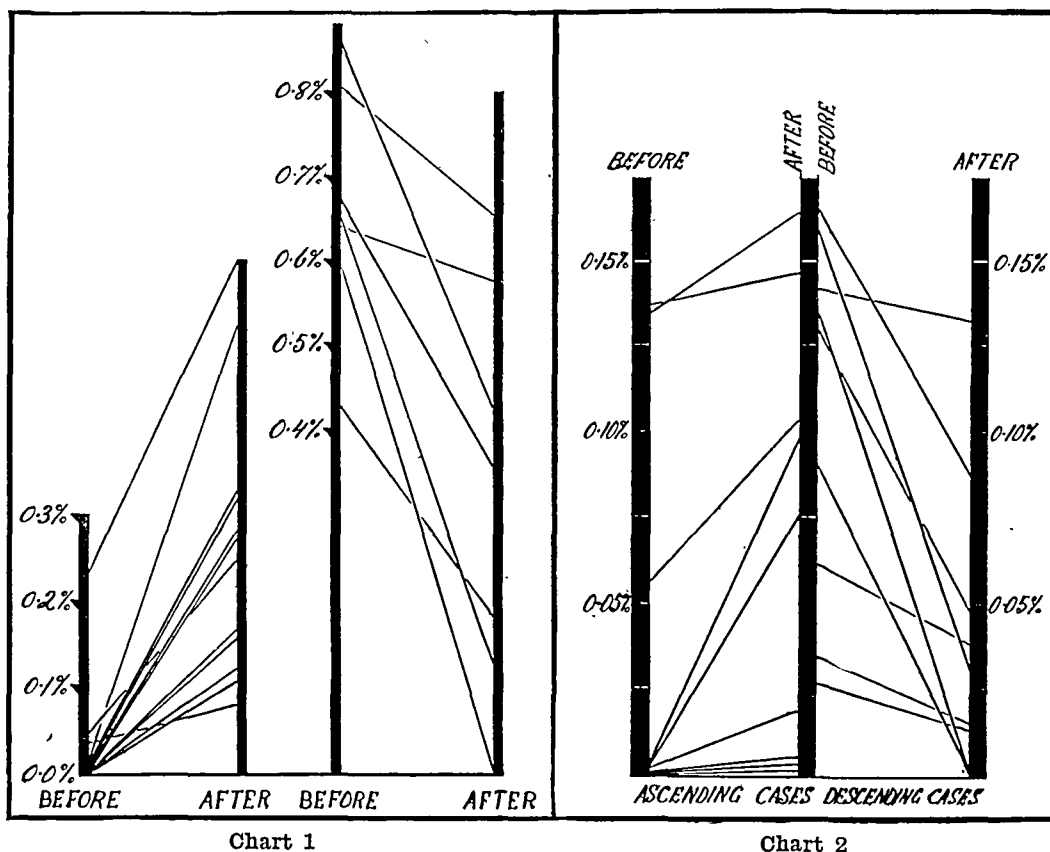


Chart 1.—Illustrating that the effect of ether anæsthesia upon the neutral fat content of the white blood cells depends upon the concentration of neutral fat in the leucocytes before anæsthesia. Chart 2.—Illustrating that the effect of ether anæsthesia upon the concentration of ester cholesterol of the white blood cells depends largely upon the percentage of ester cholesterol present in the leucocytes before anæsthesia.

But the present study revealed that the chemical composition of the white cells during the development of this anæsthetic leucocytosis was entirely different from that in fever, late post-operative states, and in the puerperium.²

PROCEDURE

The lipid composition of the white blood cells was determined immediately before and again at an interval of from one-half to twenty hours after anæsthesia in a group of non-infected patients submitted to various surgical procedures involving a relatively small loss of blood. The

previously described. The resulting extracts were analyzed by the Bloor oxidative micro-methods, as modified by Boyd.

CHANGES IN THE NEUTRAL FAT OF THE WHITE BLOOD CELLS

The leucocytes present in blood after ether anæsthesia were found to have a neutral fat content different from that of the white cells before anæsthesia. Out of 19 cases studied in 12 the percentage of glycerol fat increased and in 7 it decreased. At first sight there appeared to be no rhyme nor reason in these results, but

closer scrutiny of the cases revealed a cause for the difference in behaviour. When the leucocytes contained less than 300 mg. per 100 g. of neutral fat before anæsthesia the cells present after anæsthesia invariably possessed an increased percentage of this lipid. But when the neutral fat content was high, over 400 mg. per cent, before anæsthesia, then the leucocytes of the second sample of blood taken after anæsthesia contained a decreased amount of neutral fat. In some cases there was a marked difference in the neutral fat level before and after anæsthesia, in others the difference was relatively slight. Yet in every case when the leucocytes contained large amounts of glycerol fat before, they contained smaller amounts after anæsthesia and *vice versa*. This relationship is shown in Chart 1.

Several alternative explanations might be offered for this interesting occurrence, but the following appears most logical and simple at present. In previous studies I have found the percentage of neutral fat in the white cells to be extremely variable, even under conditions which are as nearly standard as can be arrived at. To date, only three reasons have been found to explain some of this variation: (a) a small part of it is due to experimental variation in the method of analysis; (b) inactive or degenerative leucocytes usually have increased amounts of neutral fat; and (c) white cells engaged in removing tissue debris, *e.g.*, in an involuting uterus, contain high percentages of glycerol fat. There are undoubtedly other factors which have not as yet been discovered. Whatever the reason, the leucocytes present in the circulating blood contain extremely variable amounts of neutral fat. Anæsthesia draws new leucocytes into the circulating blood from the liver, spleen, etc., and these new leucocytes added to those previously present tend to bring the neutral-fat content either down or up to a medium value, suggesting that the new granulocytes have a medium "normal" amount of neutral fat. If this explanation is correct, it follows that the leucocytes lying in the liver, spleen and other organs, and which are drawn into the blood after anæsthesia, were probably taking no active part in body metabolism but rather were previously lying dormant in these organs. They might be likened to an inactive army of reserves ready to be thrown into the front lines within a few hours' notice.

CHANGES IN THE FREE AND ESTER CHOLESTEROL OF THE WHITE BLOOD CELLS

The *cholesterol esters* of the white blood cells have been also found to be variable in amount and to behave in a manner somewhat similar to neutral fat. Out of 18 cases studied, anæsthesia lowered the ester cholesterol in 9 and increased it in 9. Although the relationship was not nearly as striking as with neutral fat, there was evidence again that the direction of the change produced by anæsthesia depended upon the initial concentration of the lipid. As seen in Chart 2, in the majority of cases in which the percentage of ester cholesterol was low before anæsthesia, it rose after, and when high before it fell after. These changes may likewise be explained as due to the effect of the circulating blood being flooded with new, previously dormant, leucocytes with a medium, "normal" ester cholesterol content. It should be noted that these data do not prove the polymorphonuclear leucocytes, which are the sole new additions to blood after anæsthesia, to contain either high or low percentages of either neutral fat or ester cholesterol but rather a medium value. Evidence has been found before³ and is being substantiated by work now in progress on the lipid composition of the white blood cells in leukæmia, that the polymorphonuclear leucocytes contain much more lipids than the lymphocytes.

Free cholesterol varied in value after anæsthesia, but on the whole exhibited no consistent changes. The concentration before anæsthesia lay between 143 and 740 mg. per cent, and after, between 63 and 448 mg. per cent. On the average, anæsthesia lowered the percentage of free cholesterol in the leucocytes, but in only 8 out of 18 cases was this so; in the remaining cases there was little change or a slight increase. It may be concluded that anæsthesia has no consistent effect upon the concentration of free cholesterol in the white blood cells, and the results need not be tabulated or described in any further detail.

THE PHOSPHOLIPID OF THE WHITE BLOOD CELLS

Anæsthesia caused a decrease in the phospholipid of the blood leucocytes in all except two cases in which a very slight increase was registered (Table I). In one of the latter 2

She was perfectly conscious and would object to her treatments, but the neck rigidity seemed to be increasing and her temperature curve was higher. Only one treatment was given intraspinally, and 20 c.c. of anti-meningococcus serum were given intramuscularly in the hope that it might reach a focus in the central nervous system that the intraspinal treatment was not reaching. The same procedure was repeated next day.

March 14th.—Cultures from the spinal fluid showed meningococci and influenza bacilli. This day the spinal fluid was very cloudy (over 1,000 cells). Some of the fluid was taken to our laboratory at the Children's Hospital of Michigan, Detroit, for a check or confirmation of the local report. One spinal drainage and treatment, given.

March 15th.—Because no progress was being made in the clearing up of the spinal fluid, a change was decided upon in the serum being used, and through the cooperation of the Parke Davis Company, Walkerville, anti-influenza bacillus serum (which is an anti-bacterial serum obtained from horses immunized with suspensions of live influenza bacilli isolated from fatal cases of influenzal meningitis) was obtained. This antiserum was proposed by Dr. Wilkes-Weiss, of the George Washington University, St. Louis, Mo., and up to July, 1933, the cases treated were summarized as follows:

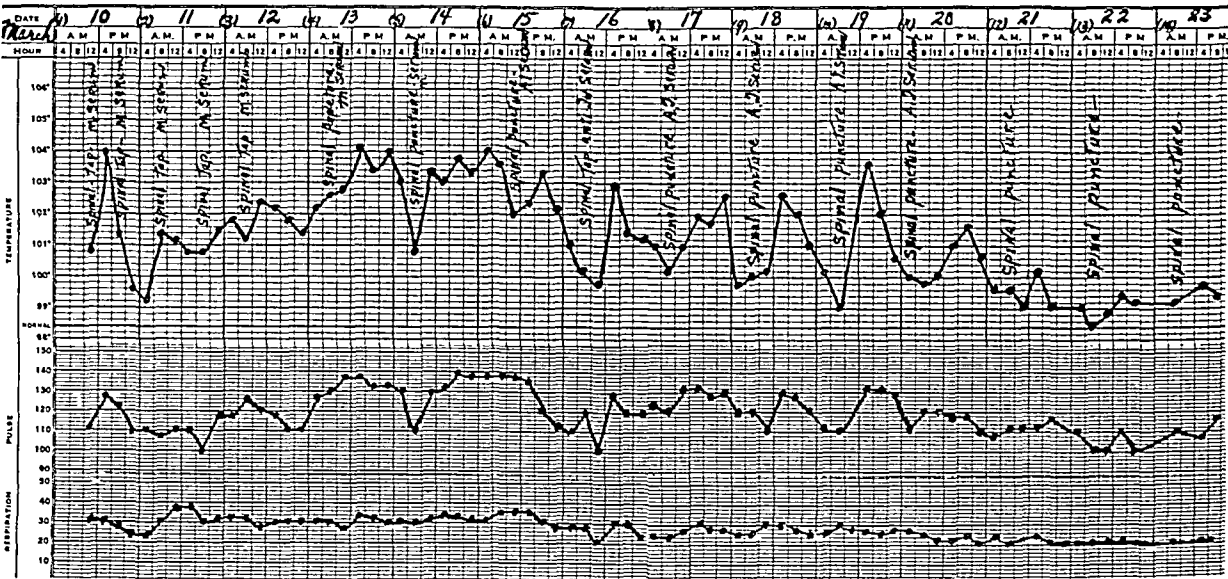
Total number reported	....	23
Recovered	.....	6 (26 per cent)
Improved; later died	.....	8 (35 per cent)
Serum was used too late	..	5 (21 per cent)
No response	.....	4 (17 per cent)

Energetic treatment had been given for five days without any improvement in the pathological process, so far as could be determined by the spinal fluid examina-

count of the spinal fluid was 470 per c.mm.; sugar, 0.033 per cent; globulin 3 plus. Culture report, influenza bacilli. The temperature ranged from 103 to 100° F. The week's treatment may be summarized as follows:

- 170 c.c. anti-meningococcus serum intraspinally
- 40 c.c. anti-meningococcus serum intravenously
- 100 c.c. anti-meningococcus serum intramuscularly
- 60 c.c. anti-influenza bacillus serum intraspinally

March 17th.—There seemed to be quite a definite improvement in the meningitis proper and the temperature curve was lower. The laboratory report on the spinal fluid showed the cell count down to 174 cells; only a faint trace of globulin was present and the last culture report showed no growth. Drainage of 50 c.c. spinal fluid was performed and only 15 c.c. of anti-influenza bacillus serum were put back. The anti-meningococcus serum was now stopped entirely. This procedure of drainage and replacing with 15 c.c. of anti-influenza bacillus serum was continued for three more days. On March 20th the spinal fluid showed 270 cells; globulin, faint trace; sugar, 0.042 per cent. The daily cultures had remained negative; that is there had been no growth on any daily culture since the 17th. This was the last day that any serum was given. The temperature was still elevated to 103° F. for the high point and 99° F. for the low for the day. The cell count in the spinal fluid was still 270 cells, but we concluded that both might be a serum reaction, and decided to use only daily drainage. The assumption seemed correct, as the cell count fell each day and on the 25th showed 12 cells per c.mm. of spinal fluid. The temperature also fell and remained normal after March 21st. The total amount of anti-influenza bacillus serum used was 120 c.c., all of it used intraspinally. The total anti-meningococcus serum used



tions and the temperature course, although there was definite improvement in the general condition of the patient; so after withdrawing 40 c.c. of spinal fluid 30 c.c. of anti-influenza bacillus serum were replaced intraspinally, but we could not entirely forget our other organism, so anti-meningococcus serum was given intramuscularly.

The report on the spinal fluid from the Children's Hospital of Michigan indicated a pure culture of influenza bacilli. Next, the culture and the anti-influenza bacillus serum were mixed. Agglutination took place, so we decided to give only anti-influenza bacillus serum intraspinally.

March 16th.—Repeated spinal drainage and 30 c.c. of anti-influenza bacillus serum intra-spinally. The cell

was 310 c.c., divided into 40 c.c. intravenously, 170 c.c. intraspinally, and 100 c.c. intramuscularly. The state of the spinal fluid throughout the illness is tabulated on page 165.

The child was improving each day, and by the end of the month was so well that she was allowed to go home. Since then, until the present time (October, 1935) she has not been ill. She had a tonsillectomy in August and has progressed normally, and there do not seem to be any sequelæ from her illness.

COMMENT

In this case the onset, as in the majority of the cases, was with irritability and symptoms

SPINAL FLUID

Date	Cell Count	Sugar	Globulin	Culture
1935 Mar. 10	1000	Negative	++++	(Smear) Meningococcus
" 11	5000	Negative	++++	Meningococcus
" 13	700	Faint trace	+++	Meningococcus and Influenza Bac.
" 14	1465	0.048	+++	Influenza Bac.
" 15	500		+++	
" 16	470	0.033		Influenza Bac.
" 17	174	Faint trace	++	Culture Neg.
" 19	180	Faint trace	+	Culture Neg.
" 20	270	0.042		Culture Neg.
" 22	60			Culture Neg.
" 25	12			Culture Neg.

referable to the gastro-intestinal tract, uncontrollable vomiting, with a low grade fever. The age and sex are also in agreement. Influenzal meningitis is a disease of early infancy, and especially in the first and second years of life, and females are more susceptible, or, rather, show a higher percentage involved. The infection is primary in the meninges in the majority of cases, and undoubtedly our case was a primary meningitis.

There was never any difficulty in securing ample drainage of spinal fluid, and the tendency in this infection is not to form adhesions. An observation made was that there was a severe headache when drainage reached about 30 c.c., and vomiting occurred once. We would have to stop drainage when we went much beyond this amount, as the patient became very restless.

I do not feel that in this case we were dealing with a meningococcus meningitis. Our first im-

provement was entirely due to overcoming the dehydration and the relief of intra-cranial pressure by spinal drainages, but as soon as we introduced the anti-influenza bacillus serum intraspinally the cerebro-spinal fluid began to clear, the cell count fell, and the organisms disappeared, as shown by the negative cultures.

The opinion seems to be that spinal drainage and non-specific therapy have some value in the treatment of influenzal meningitis, which is undoubtedly true in so far as improving the general condition and the relief of symptoms are concerned, but in this case there did not seem to be any improvement in the meningitis proper until the introduction of specific serum; then in three days a negative culture was obtained and rapid recovery ensued from then on, even with less intensive treatment (only one drainage and treatment each twenty-four hour interval), which is of considerable importance in an infant or small child.

I feel that the serum was specific for the organism in this case, and wish to convey my appreciation to Parke Davis Company, Walkerville, who graciously provided the anti-influenza bacillus serum, and to Dr. F. A. Millard, of that company, for his interest and cooperation, also to Dr. S. M. Asselstine for his assistance with the patient and for the laboratory work.

REFERENCE

1. NEAL, J. B., JACKSON, H. W. AND APPLEBAUM, E.: Meningitis due to influenza bacillus of Pfeiffer, *J. Am. M. Ass.*, 1934, 102: 513.

OTHER ARTICLES

- WARD, H. K. AND FOTHERGILL, LER.: Influenzal meningitis treated with specific anti-serum and complement: Report of five cases, *Am. J. Dis. Child.*, 1932, 43: 873.
- RITTENBERG, B.: Influenzal meningitis: report of a case, with complete recovery, *J. Am. M. Ass.*, 1934, 102: 1674.
- HART, A. P.: Influenzal meningitis, *Canad. M. Ass. J.*, 1932, 27: 163.

EUGENIC STERILIZATION OF THE FEMALE IN GERMANY.

—Since compulsory sterilization for hereditary diseases was introduced in Germany in 1933 some 45,000 eugenic castrations have been done, in about equal numbers in women and men. These are official figures, reported this year. Professor F. van Mikulicz-Radecki gives particulars of over 6,000 sterilizations in the female done at 47 gynecological and general hospitals up to the end of 1934. These were attended with a mortality of 0.41 per cent.—5 deaths from local infection, 8 from disease of the heart or circulation, 6 from post-operative bronchial pneumonia, 1 from hemorrhagic diathesis, and 5 from the disease for which castration was done. The average stay in hospital lasted 16 days: interference with the dressings by insane patients led not seldom to infection

of the wound, so that a firm adhesive dressing encircling the belly is recommended. Apart from 7 examples of x-ray or radium sterilization the abdominal route was chosen in 82.4 per cent, the inguinal in 12.9, and the vaginal in 4.7. The mode of operation was in 2,067 cases crushing of the Fallopian tubes; in 1,213 displacement of the tubes; in 611 tubal extirpation with excision of a wedge-shaped portion of the uterus; in 1,555 wedge-shaped excision of the intramural part of the tubes; in 95 a radical method—total or supravaginal amputation of the uterus. Beuttner's operation, removal of the adnexa, or ovariectomy—and in 11 cases the tying of a knot in the tubes. Radical operations were as a rule done because there was coincident organic disease of the genitalia.—*Zentralbl. f. Gynäk.*, July 27, 1935, p. 1749. Abs. in *Brit. M. J.*

FAT EMBOLISM*

BY R. I. HARRIS, F.R.C.S.(C.),

*Associate Surgeon, Toronto General Hospital,**Toronto*

FAT embolism is one of the tragedies which may haunt the efforts of the orthopaedic surgeon. True, it occurs but rarely, but the dramatic suddenness of its onset and the fatality of its outcome create a profound impression.

Fat embolism occurs when fluid fat occludes the capillaries of important organs. The fat may come from any of the fat depots of the body, but, for mechanical reasons which will be discussed later, the fat contained in bone marrow is the commonest source. Normally, fat is stored in the form of globules, fluid at body temperature, within the cell envelopes of fat cells. Before fat embolism can occur this fat must be set free by rupture of the cell membranes. Accidental or operative trauma is the usual agent which does this and it sets free a quantity of fluid fat. Since bone marrow is the common source of the fat which gives rise to fat embolism, fractures, and to a less extent, orthopaedic operations on bones, are the usual antecedents. Though it is a rare complication of orthopaedic operations, it probably is more frequent than is realized, since it is not readily recognized.

THE MECHANISM WHEREBY FAT EMBOLISM
ARISES

It seems curious that such a normal constituent of the body as fat can give rise to fatal embolism. Some consideration of the complex mechanism involved is essential to a clear understanding of the lesion. In lipæmia fat may be present in the blood stream in large amounts without embolism occurring. Lipæmic fat, however, is finely emulsified and the finely divided particles easily pass through the capillaries. In fat embolism the fat is present in globules sufficiently large to fill the capillaries completely. Once this has occurred, the viscosity of the fat

may be so great as to prevent the blood pressure behind from driving it through the capillaries. It is evident that fat embolism can only occur when fluid fat is set free in considerable amounts and under circumstances which will permit its easy entrance into the blood stream.

The cell membranes of fat cells are easily ruptured. Any trauma which involves adipose tissue results in the freeing of considerable quantities of fat, which at body temperature is quite fluid. The briefest observation will reveal how surprising is the amount of fluid fat which may be set free during an operation. From such a simple procedure as the removal of a bone graft from the tibia there may accumulate as much as an ounce of fluid fat. When bones are injured, therefore, there is no lack of free fat for the potential production of emboli.

The mechanism whereby this free fat enters the blood stream is less evident. Though veins may be cut across or torn by operations or trauma, which at the same time free fat from its cell envelope, it is unusual for fat to enter the venous system. The sectioned veins collapse and the pressure of venous blood causes slow outpouring from them until such time as spontaneous clotting occurs. Fat can only enter the venous system under circumstances which will prevent the open ends of the veins from collapsing and which will permit the fluid fat to accumulate at a pressure greater than the venous pressure. Three things are necessary therefore: (1) free, fluid fat; (2) accumulation under a tension which is greater than venous pressure; and (3) open veins, the ends of which do not collapse. Only under very special circumstances, fortunately, may we expect to see fat embolism.

Injuries to bones provide exactly the factors necessary for the production of fat embolism. There is abundance of fat in the bone marrow, readily set free by trauma or operation. The veins are held open by their attachment to the

* Chairman's address read before the Section of Orthopaedic Surgery, Canadian and American Medical Associations, Atlantic City, June 13, 1935.

bony Haversian canals in which they run. It is not difficult for the wound exudate to accumulate under considerable tension. In operations upon soft tissue the reverse is the case. Though there is abundance of adipose tissue and though much fat may be freed, entrance into the venous system is prevented by collapse of the veins. Wound exudate is less likely to accumulate under tension; more often it seeps out along the line of suture. There is less opportunity for the application of firm dressings than in operations upon the extremities, and hence less sealing of the exudate within the wound. Fractures and orthopædic operations, therefore, constitute the most frequent antecedents of fat embolism.

THE PATHOLOGY OF FAT EMBOLISM

Once the fluid fat has been forced into the venous system it is carried by the blood stream to the capillaries of the lung. The extent of the pulmonary embolism which thus arises is dependent upon the amount of fat which enters the blood stream and the length of time during which entry is occurring. A large amount of fat forced rapidly into the venous system will produce the maximum effect, while a small amount, especially if forced in slowly, may cause no symptoms whatsoever. Extensive pulmonary embolism with fat gives rise to a definite clinical picture, the outcome of which is often fatal. Obstruction of the pulmonary capillaries interferes with oxygenation of the blood; hence cyanosis is a prominent symptom. The peripheral blood pressure falls from failure of an adequate amount of blood to reach the left heart. Damming back of the pulmonary circulation results in great dilatation and ultimate failure of the right heart.

If the right heart is sufficiently powerful it may force some of the fat emboli through the pulmonary capillaries into the peripheral circulation. There it again comes to rest in the capillaries of any part of the body. The resultant symptoms are dependent upon the nature and importance of the organ involved. Cerebral embolism is the most common, most important, and most serious manifestation. This occurs naturally at a time subsequent to the pulmonary manifestations and it also is often fatal. The cerebral lesions which result are focal areas of necrosis, centred upon the occluded artery and surrounded by a zone of hæmorrhagic exudate. Though the

cerebral lesions are the most important of the peripheral manifestations, emboli may occur in any organ. Of the fat emboli which reach the kidney a considerable quantity are excreted in the urine. This is of importance since it constitutes one of the few exact means by which the condition can be recognized.

THE CLINICAL MANIFESTATIONS

From a consideration of the pathology of fat embolism it is evident that the lesion will manifest itself most often and most conspicuously in two principal ways, corresponding to the involvement of lung and of brain.

Pulmonary form.—Symptoms of pulmonary fat embolism appear shortly after the fracture or operation. They may be so severe as to cause death in a few hours or so mild as not to be recognized. It is obvious that the severity of the symptoms will depend upon the amount of fat which has occluded the pulmonary capillaries. Within a few hours the patient becomes cyanosed, complains of a sense of constriction about the chest, and suffers air hunger. The pulse becomes rapid, feeble and irregular. The blood pressure falls. Death occurs from cardiac and respiratory failure. As Warthin¹ pointed out in his classic monograph, the distended capillaries may rupture and pour into the alveoli some of their contained fat. The sputum then contains free fat globules and fat-containing alveolar endothelial cells.

Cerebral form.—This appears later than the pulmonary form, usually after the lapse of two or more days from the accident. In this interval the patient is free from any cerebral symptoms. Then follows restlessness, delirium, drowsiness and coma. Death may follow, but recovery may take place. As this is a manifestation of systemic fat embolism, the evidences of involvement of other organs may be present. Most important of these, from the viewpoint of diagnosis, is the presence of fat in the urine as the result of kidney involvement.

DIAGNOSIS

The diagnosis of fat embolism is not easy. Since most cases occur in patients who have suffered severe injuries or have undergone extensive operation it is not unnatural to regard their symptoms as due to cerebral concussion or shock. Even at post-mortem recognition may be difficult as the emboli are dissolved by the ordinary

preparation of specimens in graded alcohols. Fat emboli can only be demonstrated by fat stains on frozen sections. It is altogether likely that mild degrees of fat embolism are common. An appreciation of this will be the most important aid to diagnosis. The knowledge that fractures and orthopædic operations are frequently followed by fat embolism will lead one to regard any pulmonary, cardiac or cerebral symptoms which may supervene as possible evidences of the condition. We lack a definite and certain test to determine the presence of fat embolism. Warthin, who first noticed the fat in the sputum, was inclined to think it was present in every case, but many writers have not been able to confirm this. The presence of free fat in the urine when it occurs is an extremely valuable aid to diagnosis. It cannot occur, of course, until systemic invasion has occurred, and sometimes is not then present. To date, the diagnosis of most of the cases is based on post-mortem evidence. With increasing recognition of the importance of fat embolism more cases are being diagnosed on the basis of clinical symptoms.

FAT EMBOLISM COMPLICATING ORTHOPÆDIC SURGERY

The occurrence of fat embolism as a complication of orthopædic operations is a matter worthy of serious consideration. Many fatal cases, proved by post-mortem, have been reported in the literature. It is more than probable that many fatal cases have died without the true diagnosis being made and innumerable milder cases have recovered without the suspicion of fat embolism. As Bissell² observes, the falling arterial pressure and rising venous pressure of fat embolism closely resemble post-operative shock, and not unnaturally the death of a patient within a day or two of operation with a rapid feeble pulse is usually attributed to shock. The usual methods of examining tissues removed at post-mortem fails to reveal fat embolism. Frozen sections and fat stains are necessary. Hence many cases almost certainly are missed.

My own interest in fat embolism commenced with the loss of a patient following an operation for arthrodesis of a tuberculous hip.

CASE 1

A.G., a seventeen year old French-Canadian boy, was admitted to Weston Sanitarium on June 27, 1934, for tuberculosis of the hip. The history was characteristic and the physical findings and x-ray were equally characteristic. On November 22, 1934, an operation for

arthrodesis of the hip was performed. This involved exposure of the hip through a Smith-Peterson incision, the removal of carious bone, and the placement of a large graft across the line of the joint from the acetabulum to the neck of the femur. The operation was expeditiously performed and gave rise to no shock. A transfusion of 500 c.c. of blood followed as a routine measure. Two hours after the operation he was in good condition, except for a rapid pulse. Six hours after he became cyanosed and complained of a sense of constriction about his chest. The cyanosis steadily increased, the pulse became rapid and feeble, and the temperature rose to 103°. He died twenty hours after operation. Post-mortem examination revealed extensive fat embolism of the lung and slight fatty infiltration of the heart muscle.

I am indebted to Dr. K. G. McKenzie for the opportunity of reporting the following case.

CASE 2

H.L., a male, 35 years of age, sustained a fracture of the tibia on April 2, 1935. There was no head injury and he was not unconscious. The fracture was treated by open reduction and plating on April 3rd. He remained conscious and perfectly clear mentally until April 5th. April 6th he became restless, would not respond to questions or cooperate in examination. Though he had had no sedative, he could be roused only with difficulty. He would not talk. There was no paralysis. Lumbar puncture revealed a clear fluid under increased pressure (17 c.m.). The pupils were equal and small. There was early choking of the disks. On this day he commenced to cough up some frothy bloody sputum. The temperature was 102° F. and the pulse 120. The succeeding day he remained stuporous with intervals of restlessness. He remained restless and irrational until April 12th, then slowly improved. By April 19th, he had apparently recovered completely from the cerebral lesion.

The urine collected on April 7th contained fat. The sputum was not examined for fat. On April 16th he developed a patch of pleurisy on the right side, which cleared up in two days, and on April 23rd a similar transient pleurisy occurred on the left side.

Comment.—This is a clear example of cerebral fat embolism with recovery. The history of fracture and operation, the late appearance of cerebral symptoms, and the presence of fat in the urine are all characteristic features. The late pleurisy probably represents the cyclic embolism of the lung described by Warthin.

The following two cases are included as probable examples of fat embolism, though definite evidence is lacking.

A ten-year old boy was operated upon for the removal of sequestra from osteomyelitis of the tibia. Towards the end of a rather long operation his respiration became embarrassed, cyanosis supervened, and he stopped breathing. After an interval of artificial respiration, respiration recommenced, but was irregular. Finally death occurred in half an hour. Post-mortem examination failed to reveal any clear reason for death. Fat embolism was not suspected and was not specifically sought.

A forty-year old male was operated upon for the purpose of fusing a tuberculous hip. As the operation was being completed his respiration became embarrassed. In spite of artificial respiration he died on the table. Post-mortem examination did not reveal any clear cause of death. Fat embolism was not suspected and not sought for.

Comment.—These two cases resemble closely the proved cases quoted by Timmer³ in which death followed operation and post-mortem revealed fat embolism of lung and brain. They are unusual in the rapidity of onset and the severity of the symptoms and the early death. They suggest that sudden death during operations may sometimes be caused by fat embolism.

TREATMENT

Unfortunately we have no adequate treatment for fat embolism. Much can be done to prevent it by the careful handling of fractures. The more the site of fracture is traumatized by unnecessary handling, the greater will be the amount of fat set free and the greater will be the tendency to drive it into the venous system. It might well be that fat embolism following orthopædic operations could be prevented by draining the wound for twenty-four hours. This would permit any free fat to drain away and would prevent the accumulation of wound secretions under the tension necessary to drive them into the veins. Ryerson's suggestion that a tourniquet will prevent the occurrence of fat embolism is probably a valuable one. Certainly, while the tourniquet is on no embolism can occur and during this interval the opened veins have an opportunity to develop occluding thrombi.

Once established, fat embolism can only be treated by symptomatic measures. Venesection to relieve the distended right heart is probably

of value. The administration of saline solution intravenously may facilitate the passage through capillaries and aid in freeing some of them from their fatty emboli. An oxygen tent should be used for the treatment of cyanosis.

CONCLUSIONS

1. Fat embolism is a serious complication of injuries to and operations upon bone.
2. Its occurrence is probably more common than is realized, since the symptoms may easily be mistaken for shock and the lesion will not be found post mortem unless special methods of examination are used.
3. Clinically, it manifests itself in a pulmonary and a cerebral form.
4. The occurrence of fat in the sputum and in the urine are valuable diagnostic signs.
5. The possibility that pulmonary embolism may complicate orthopædic operations should be borne in mind and such preventive measure taken as seems valuable. A tourniquet should be used in operations on the extremities. Drainage of wounds of bone for twenty-four hours probably would prevent at least some cases of fat embolism.

REFERENCES

1. WARTHIN, A. S.: Traumatic lipæmia and fatty embolism, *Internat. Clin.*, 1913, 4: 171.
2. BISSELL, W. W.: Pulmonary fat embolism; frequent cause of post-operative surgical shock, *Surg., Gyn. & Obst.*, 1917, 25: 8.
3. TIMMER, H.: Epileptiform convulsions and fat embolism after non-surgical orthopædic intervention, *Abst. J. Am. M. Ass.*, 1919, 73: 1403.

THE ANO-RECTUM IN CHRONIC CONSTIPATION

By E. A. DANIELS, M.Sc., M.D.,

Montreal

THE lesions observed in the ano-rectum in certain patients suffering from chronic constipation are instructive. In simple constipation of short duration such changes are usually not observed, but when the condition for one reason or another becomes chronic, then definite changes in the terminal bowel may be observed. The correction of these pathological lesions when they are marked and well established before the institution of any form of anti-constipation régime, appears to offer the patient a better prospect for ultimate cure. Moreover, in certain obstinate and intractable

cases of constipation, after many forms of medical treatment have failed, one will often be surprised upon examination to discover certain ano-rectal abnormalities, correction of which renders the stubborn case easily responsive to medical measures.

PHYSIOLOGY OF THE RECTUM

It is unnatural for the rectum to store faecal material, or to pass faecal residue explosively in a semi-liquid or liquid state. This is one of the premises upon which this study is based. The slow mass movement of the colon, which

of the anal canal, which is that part of the anal canal extending from the anal papillæ (the base of the columns of Morgagni, *i.e.*, the openings of the anal crypts) to the white line of Hilton. Hilton first described the white line in 1863, as follows: "A white line, which in the living subject any surgeon can recognize, shows the junction of the skin and mucous membrane. That white line corresponds exactly to the lineal interval between the external and internal sphincter muscle. It is an important landmark, exact and truthful, so that it can be relied upon." Below the white line of Hilton, often referred to as the muco-cutaneous junction, the anal canal is lined by squamous epithelium, indistinguishable from ordinary skin.

Marked spasm or actual narrowing of the anal outlet has been observed quite frequently in chronic obstipation. Miles first described such a narrowing and attributed this to an actual band of constriction, (likened to a rubber umbrella ring) in the region of the pecten. Lawrence Abel,² confirming Miles' observations, demonstrated this pecten band histologically as a circular band of fibrous tissue deposited between the mucosa of the pecten and the external sphincter muscle. Abel applied the name "pectenosis" to this abnormal stenosis and fixation of the lower half of the anal canal. The anus may become almost completely stenosed, and bulky stools cannot be passed. The patient must now resort to the continual process of liquefying the stool in order to effect its passage. In Abel's original contribution he reports the frequency of faecal impaction and even of intestinal obstruction in this abnormal state.

It would be difficult to determine the exact sequence of events in pectenosis and to decide its time-relationship to the constipated state. Abel regards pectenosis as the result of factors which favour passive congestion in the region of the pecten, and mentions constipation and dilatation of the superior hæmorrhoidal venous plexus (piles) as frequent causes. Other factors which produce congestion in the anal canal and pecten are the long-continued use of purgatives, diarrhoeas, ulcerative lesions of the colon, proctitis, passive congestion of the portal venous system, pelvic inflammatory disease, uterine displacements, urethral stricture and prostatism. It may therefore be seen that

pectenosis may be the cause or effect in certain cases of chronic constipation, and that, once constipation and pectenosis are established together, there ensues a formidable barrier to normal bowel evacuation. Liquefaction of the faecal mass, which normally arrives in the sigmoid in the formed state, will become the only available alternative to the patient, if the lesion is not recognized and corrected. The attempted passage of a formed faecal motion will invariably produce trauma, and anal fissure frequently results. Abel quite reasonably regards fissure as secondary to pectenosis. Fissure is more often observed dorsally at the vulnerable point in the anal circumference, because of the decussation of the fibres of the external sphincter muscle, which pass backward to be inserted into the coccygeal raphe. In parous women anterior fissures are also frequently seen, because of the thinning out of the perineal body and its resultant loss of support anteriorly to the anal canal and external sphincter muscle.

The recognition of anal stenosis is a simple matter. A typical history of the long-continued use of cathartics and the consistent passage of liquid or mushy stools can be elicited. There is great resistance to simple digital examination (this persists under general and spinal anaesthesia); it is impossible to pass any of the ordinary rectal instruments. If the small finger is passed, a rigid, fixed anal canal, with wide separation of the external and internal sphincter muscles, can be felt. This separation is the result of the elevating action of the pubococcygeal part of the levator ani muscle, which pulls the internal away from the external sphincter muscle, thus still further increasing the difficulty of emptying the lower rectum. The pecten band can nearly always be felt as a hard ring lying immediately under the pecten, at the upper border of the external sphincter muscle. The anus has a congested bluish appearance.

CHANGES IN THE CRYPTS OF MORGAGNI AND ANAL PAPILLÆ

In chronic constipation infection of the crypts of Morgagni and inflammation of the anal papillæ may frequently be observed. The crypts in such cases are oedematous and congested, and by retrograde pressure pus can often be expressed from their openings at the

ano-rectal border. The anal papillæ in such cases are œdematous, pinkish in colour, and may be markedly hypertrophied and even poly-poid. Not infrequently a sinus or a fistula will be discovered leading from a diseased crypt. This may be blind, or open on the skin surface. Anal spasm of some degree is invariably present, and an early or well established pectenosis may also be demonstrated.

The passage of liquid stools, especially after the habitual ingestion of salines and other harsh purgatives, will frequently antedate the development of cryptitis, papillitis, peri-anal suppuration and fistulæ. Liquid faecal material, precipitately passed, will favour the arrest of bacteria-laden residue in the anal pockets, with infection of the crypts of Morgagni and the peri-anal glands. Tucker and Hellwig,³ report such cases of cryptitis as foci of infection, and describe several cases to substantiate their theory. Perhaps, some day, with further study and adequate controls, it may be possible to evaluate properly the rôle which the anal crypts play as possible foci of infection.

CHANGES IN THE MUSCLES OF THE ANO-RECTUM

In chronic constipation changes in the muscles of the ano-rectum are frequently observed. The levatores ani may undergo marked hypertrophy. Any of the lesions thus far outlined, or any factor which produces a mechanical obstruction to bowel evacuation, will result in hypertrophy of the levatores ani. Hypertrophy and thickening of these muscles are also observed in the female whose obstipation is the result of such conditions as enterocele and where there are bad perineal lacerations. In the male where there is marked prostatic hypertrophy obstipation and much straining at stool ensues, with hypertrophy of the levatores. Hypertrophy of these muscles is easily recognized by digital rectal examination. At the level of the ano-rectum two very thick strongly muscular shelves can be felt, spreading out laterally from the bowel, with a measure of encroachment upon the bowel lumen. The contrast with the normal is very marked, and if one learns to palpate these muscles, it is easy to recognize their hypertrophy.

Spasm and hypertrophy of the external and internal sphincter muscles are also observed in obstipation resulting from any of the ano-

rectal lesions already outlined. The anal sphincter muscles can be rolled between the thumb and forefinger, and thus spasm and hypertrophy are easily recognized.

CHANGES IN THE PERI-ANAL SKIN

Peri-anal skin changes are frequently observed in chronic constipation. Irritation and pruritus are often present where the patient has frequent passages of liquid stools. Liquid paraffin produces an oily faecal leak in many patients, and cryptitis, pruritus ani and rectal discomfort have been repeatedly observed in such cases.

SUMMARY AND CONCLUSIONS

The anatomical changes in the ano-rectum in certain cases of constipation have been recorded. Their frequency is difficult to determine.

The long-continued ingestion of purgatives has been observed to be closely associated with the ano-rectal abnormalities observed.

The problem of numerically determining the frequency of ano-rectal lesions in chronic constipation is further complicated by the differences of opinion concerning the definition of the constipated state.

The object of this thesis is to demonstrate that in chronic constipation certain definite recognizable ano-rectal lesions may occur which act as formidable factors in resisting treatment by simple medical measures.

The ano-rectal changes described may be present in a symptomless form. The patient may regard the ano-rectal difficulty as a necessary part of the obstipated state, and, even when troublesome, may neglect to direct the physician's attention to this feature of the case.

The writer feels that the state of colonic tone has been overemphasized as a cause of constipation, to the almost complete exclusion of a proper recognition of ano-rectal abnormalities.

BIBLIOGRAPHY

1. ALVAREZ, W. C.: *The Mechanics of the Digestive Tract*, P. B. Hoeber, N.Y., 2nd ed., 1928, p. 250.
2. ABEL, A. L.: The pecten, the pecten band, pectenosis and pectenotomy, *The Lancet*, 1932, 1: 714.
3. TUCKER, C. C. AND HELLWIG, C. A.: Histopathology of the anal crypts, *Trans. Am. Proctologic Soc.*, 1933, p. 47.
4. HERMANN, G. AND DESFOSSES, L.: Sur la muqueuse de la région cloacale du rectum, *Compt. Rend. Acad. des Sci.*, 1880, 90: 1301.
5. HARRIS, H. A.: Some embryological aspects of the problem of fistula in ano, *Proc. Roy. Soc. Med.*, 1929, 22: 1341.
6. LOCKHART-MUMFERY, J. P.: Fistula in ano, *Proc. Roy. Soc. Med.*, 1929, 22: 1331.

LUMBAGO AND SCIATICA

By S. A. WALLACE, M.D., C.M., F.R.C.S. (EDIN.),

Kamloops, B.C.

IT is the general opinion at present that lumbago and sciatica form a combined condition and especially so in the chronic cases. The etiology of both is a fibrositis; in the one case affecting the fascial layers, muscle sheaths, and aponeurosis, and in the other, the nerve sheaths.

LUMBAGO

An acute attack of lumbago is usually caused by a sudden strain, such as trying to get a little extra distance off the tee, or a sudden lift in the stooped position. Along with this may be a mild sort of chill, probably hardly noticed, but enough to depress the circulation through the capillaries and lymphatics so that they are unable to take care of the products of katabolism. Frequently two types are seen—the rheumatic, with cold sweating extremities becoming purple quickly in the cold, sluggish bowels and perhaps thyroid hypo-function, and the other in the well-fed obese business man leading a sedentary life.

Chronic lumbago usually gives the history of an initial strain and exposure. Heavy labouring work tends to cause back strain, which may be aggravated by postural abnormalities. Flat feet may be a cause of backache. Constant motor driving in a badly fitting seat may be a factor. Before stating that a case is one due to strain only other conditions must be eliminated, such as tuberculous and malignant osteomyelitis, sacralization of the 5th lumbar vertebrae, and osteo-arthritis, more frequent in persons around fifty and where the back is at all stiff.

According to Bankhart¹ these chronic strains are classified simply as: (1) sacro-iliac; (2) lumbo-sacral; (3) lumbar.

Sacro-iliac strain is a very frequent condition and may become chronic, so that the original trauma is almost forgotten. The sacro-iliac joint is lined with synovial membrane and it is now thought that a limited movement may take place there. All the weight of the body passes through these two joints and the muscles and ligaments are in use, both in lying and standing, so that in strain pain may be complained of in either position. Pain is usually referred

directly over the joint and, if asked to, the patient will identify the joint line with the tip of the finger. Frequently pain is referred down the thigh, making differentiation from sciatica necessary.

Lumbo-sacral strain arises in the joint between the sacrum and the 5th lumbar vertebra. The upper surface of the sacrum slopes forward at an angle of 50° with the horizontal, and the 5th lumbar vertebra tends to slip forward. Pain is usually referred over the last lumbar spine.

Lumbar strain may occur anywhere along the lumbar vertebrae, and is often found following trauma to the transverse processes and muscles.

The examination should be done with the patient stripped, and while he is standing at ease observe the general posture, the curve of the back, the shape of the legs and the condition of the feet. Next, while he is lying on the back, flex each thigh with the knee bent and see if the hip is free, at the same time watching the lumbar curve. The leg is now kept straight and lifted upward. In both sciatica and sacro-iliac strain this movement is checked by spasm of the hamstrings. Usually in sciatica pain begins to be felt when the leg is at 140°, and is complained of most often in the middle of the thigh, but sometimes over the sciatic notch and also down the leg. This is called Lasèque's sign. Another very useful diagnostic sign has been brought forward by Mennel. When the extended leg is lifted till pain is felt in the back of the thigh it is now dropped a little and the foot is sharply dorsiflexed. In sciatica pain is again felt in the middle of the thigh, but in sacro-iliac strain nothing would be felt. When the leg is flexed further at the hip, in sacro-iliac strain pain is felt directly over this joint, since a rotation of the ilium on the sacrum occurs at this time. With the patient on his face hyperextension of the thigh causes pain over the joint in sacro-iliac strain. Again, while he is lying on his side, flexing the leg underneath and having him hold the knee firmly, hyperextension of the upper leg will give pain in the sacro-iliac joint if it is affected, since rotation occurs. With the

patient standing have him bend forward, keeping the knees straight, and try to touch the floor. In sciatica, sacro-iliac strain or lumbo-dorsal strain, the hands might only reach as far as the knees. Since in flexion of the spine the first movements take place at the lumbo-sacral joint, in purely lumbar strain pain may not be felt till flexion proceeds and affects the upper joints. Lateral movements of the spine are usually limited in lumbar strain. Buckley² has shown that in sacro-iliac strain it is impossible to bend forward and touch the toes with the knees extended but if sitting on a low stool movement is freer, whereas in lumbo-sacral strain sitting does not help.

SEPTIC FOCI

Before any treatment is begun for lumbago or sciatica a careful search for septic foci should be made. Usually this is negative. Every hospital has its invalids from multiple arthritis deformans from whom every thing possible has been removed without benefit, but still there are cases in whom the removal of septic foci will produce a sudden cure. According to recent writers, septic teeth and tonsils are likely to produce fibrositis in the upper extremities, and infection of the gall bladder, bowel, pelvis and prostate might produce lumbago, sciatica and synovitis. The *S. viridans* is the common organism in infected tonsils and teeth, the colon bacillus in alimentary and urinary infections, and the gonococcus and staphylococcus in prostate troubles. The teeth are at fault in over half the cases of septic absorption, and usually the worst cases are the apical abscesses, often discovered only by the x-ray, pyorrhœa and carious stumps being more likely to produce stomach disorders. In examining the tonsil a wooden tongue blade in each hand is useful, one to hold the tongue down and the other to massage the tonsil and see if any lumps of pus can be expressed. The infected gall bladder and sluggish bowels might have some effect on rheumatic disorders. Pelvic inflammations and an eroded cervix are often associated with backache, as is the infected prostate.

Treatment.—The treatment of an acute attack of lumbago consists at first of putting the patient at rest, applying large fomentations or poultices, or using a hot iron passed over brown paper. The electric pad gives some comfort. The injection of a novocain solution into the

muscle gives instant relief for a time. Dover's powder and aspirin, grs. x of each, followed by a hot drink, causes perspiration and relief. Later, infra-red treatments, with massage and analgesic liniments are beneficial. A saline cathartic is given and rich food eliminated from the diet. Hot baths are useful, and to the water may be added a pound of washing soda or Epsom salts.

The chronic cases of lumbago and back strain are more difficult to treat. In these cases adhesions are present, as after the original trauma, which may have been quite slight, an exudate is thrown out and during the period of lessened movement adhesions have had time to form. The complicated joints of the spine are more liable to locking and adhesions, and the powerful adjacent muscles are thrown into a painful spasm. During the last few years manipulative treatment of such cases has given excellent results. It is necessary to have the patient deeply anæsthetized. Mr. Bankhart,¹ of the Middlesex Hospital, London, uses four main movements, which will be described in detail.

1. With the patient on his back a leg is placed on the manipulator's shoulder and the hands used to keep the knee extended. The leg is now forced upward, putting the hip joint into extreme flexion. An assistant makes pressure over both anterior superior iliac spines, to keep the pelvis flat. The other leg is now similarly manipulated.

2. With the patient on the back an arm is placed under both knees, and the thighs are brought up over the body until the knees are on each side of the head. This gives full flexion of the spine.

3. With the patient still on his back, an assistant makes firm pressure with both hands over the right anterior superior iliac spine, and the manipulator standing on the opposite side of the table reaches over and seizes the right arm and shoulder and pulls it forcibly forward and sideways toward him, causing a rotation of the lumbar vertebræ. It is during this movement that one so often hears the creaking of adhesions breaking down. The other side is now similarly manipulated.

4. The patient is now placed on his face and one arm placed under both thighs just above the knees, the thighs are now forcibly lifted and the back kept down by placing the free hand over the middle of the lumbar area. This forcibly hyperextends the spine. Mr. Bankhart says that the strength of an ordinary man will not do any harm in spinal manipulations.

In sacro-iliac strain one or two of the following movements are performed as well. (1) With the patient on his back, and with the affected side well over to the edge of the table so that the leg can hang over, the thigh is hyperextended with moderate force. (2) In the same position pressure is made backwards on the anterior superior iliac spine and forward on the tuber ischii. (3) To manipulate the left side the patient is placed on his right side and the left leg is allowed to hang over the table, and is placed between the operator's legs. The right arm is placed forward and the left arm backward twisting the body. The operator now grasps the

patient's left shoulder with his right hand, pushing it backward, and with his left hand on the iliac crest pushes it forwards and downwards.

If at all possible, it should be the rule that no manipulations should be done without antero-posterior and lateral x-ray plates of the spine, and particularly in persons around or past middle life. Occasionally one is surprised at the pathological changes revealed by the x-ray. The differential diagnosis includes spinal arthritis with various stages of lipping, tuberculous or malignant osteomyelitis, old injuries, such as untreated compressed fractures, spondylolisthesis, long spinous processes, sacralization of the 5th lumbar vertebræ, etc. For most of the above conditions supportive appliances are necessary. During the past year or so four patients with tuberculosis of the spine have reported to me here who had been treated for rheumatism and given massage, or had been made worse by chiropractors.

SCIATICA

The sciaticas can be grouped under two headings:— (a) primary, or idiopathic; and (b) secondary, or symptomatic, *e.g.*, sciatica in association with diabetes or that due to pressure from malignant growths. This latter group is not very common and the treatment is self-evident. The primary cases form by far the largest number seen.

Sciatica according to recent writers is associated with or follows lumbago in 90 per cent of cases, and one's personal experience would support this statement. The sciatic nerve has three main roots, the 5th lumbar, and the 1st and 2nd sacral. In the majority of cases the area of greatest pain is that supplied by the 5th root. In examining the course of this segment it is found that the opening between the 5th lumbar vertebræ and the sacrum is much smaller than the sacral foramina through which the 2nd and 3rd segments pass, although the 5th root is much larger than the others. In consequence of this tight fit any congestion or abnormality, such as local strain in the lumbo-sacral and sacro-iliac joints, owing to the close proximity of the nerve, is liable to set up a perineural fibrositis resulting in sciatica.

On examination there is usually tenderness over the sciatic notch and between the great trochanter and tuber ischii, and always in the

middle of the thigh. The pain passes down the back of the thigh and sometimes into the calf and side of the leg. In old cases there is muscular atrophy and loss of ankle jerks, and occasionally a pronation of the foot. Lasèque's sign and Mennel's sign are both present.

Treatment.—In the acute case rest and the local application of heat with sedatives is about all that can be done. In this stage deep massage and diathermy are distinctly harmful and often lead to chronicity.

In recent years a technique for epidural injection^{3,4} of normal saline through the sacral hiatus has been developed, and this has proved to be by far the best treatment for chronic sciatica. The injection can be done with or without an anæsthetic, but since the majority of sciaticas are associated with lumbago it is best to use an anæsthetic so that manipulation can be done as well. The neatest and best anæsthetic for this purpose is evipal, intravenously (evipan, in Great Britain). This gives a deep anæsthesia, and sleep comes quickly without struggle. It can be given in one's office and in an hour or so the patients are able to go home, but on the whole it is best given in the hospital. (It is not necessary, of course, to use evipal, as ether will serve the purpose). The patient is laid on his affected side and the injection of an ampoule of evipal, dissolved in 10 c.c. of distilled water, is begun. It is injected at the rate of 1 c.c. per 15 seconds and after receiving 3 or 4 c.c. the patient yawns and goes into a deep sleep; about an equal amount is again given. It is rarely necessary to go above 8 c.c. although to a particularly athletic individual we gave 10 c.c. Last summer one of the anæsthetists at the Middlesex Hospital, London, told me he gave two ampoules to a Cambridge Blue before getting relaxation. The injection into the sacral canal of about 80 c.c. of saline warmed to 120° F. is now begun.⁵ The sacral hiatus is felt as a depression about 2 inches above the tip of the coccyx, and is bounded on each side by the knob-like sacral tubercles. The tip of the left forefinger is placed over the depression and an ordinary spinal puncture needle, or a needle of about 2 or 3 inches in length is pushed through the sacro-coccygeal membrane, with the bevel pointing downwards. There is considerable resistance to the membrane, and it is easy to

tell when the needle passes it. The needle is now depressed and pushed directly upwards for 1 or 2 inches, and its point can now be felt in a free cavity. Aspiration is made, to see if the point of the needle is in the dural canal. The injection of the saline is made against slight resistance. The fluid passes upwards around the nerve roots, stretching the adhesions. Some time ago I injected 60 c.c. of methylene blue solution into the sacral hiatus of a cadaver, and through the abdomen exposed the lumbo-sacral nerve bundle; in the nerve sheath the methylene stain was plainly seen. After the injection, if it is thought necessary, manipulations as previously described are now done. In any case the sciatic nerve is well stretched.

If no anæsthetic is used enough novocain is added to bring the saline up to 0.25 or 0.5 per cent. In the skin and tissues down to the sacro-coccygeal membrane 2 per cent novocain is used. If one is unfamiliar with the insertion of the needle into the sacral canal this can be done under local anæsthesia before the injection of the evipal.

After the injection the patient is kept in bed for the remainder of the day, and sedatives given if required. The next day radiant heat and light massage are used. In only one of my cases was there a severe painful reaction. This lasted for about five days, but the final outcome was extremely good.

SUMMARY

By this method the treatment of lumbago and sciatica has proved very satisfactory. In the past it was said that medical men could do nothing for these conditions and the sufferers drifted off, usually to the chiropractors. One can now tackle these cases with confidence, as the results are extremely gratifying.

Lack of space would not permit the reporting of twenty cases.

REFERENCES

1. BANKHART, B.: *Manipulative Surgery*, Constable, London, 1932.
2. BUCKLEY, C. W.: *Fibrositis, lumbago and sciatica, Practitioner*, 1935, 134: 129.
3. EVANS, W.: Treatment of sciatica by epidural injections, *The Lancet*, 1930, 2: 1225.
4. DOUTHWAITE, A. H.: Treatment of rheumatoid arthritis and sciatica, H. K. Lewis, London, 1933.
5. WALLACE, S. A.: Sacral anæsthesia, *Canad. M. Ass. J.*, 1928, 18: 406.

ACUTE SEPTIC ARTHRITIS*

By GEORGE W. ARMSTRONG, M.D.,

Ottawa

IN attempting to choose a topic which would appeal to an audience of diversified interests my selection was prompted first, by the fact that acute septic arthritis is met by us in almost every branch of the practice of medicine; and, second, by the relative frequency with which the condition is not recognized in the early stages.

In reviewing the literature of the past ten or twelve years it has been surprising to me how little has been written upon the subject, and of what has been published a relatively large proportion deals with various forms of treatment rather than diagnosis. It will be my aim briefly to review the etiology, pathology, and treatment of the disease, and particularly to emphasize how great a responsibility rests upon the individual who is called upon to make the diagnosis.

The term "acute septic arthritis" implies the presence of pyogenic organisms inside the joint cavity. These organisms may reach the joint in one of three ways. (1) They may be implanted directly through a puncture wound into the joint cavity, for example, a gunshot wound or perforation by a nail. (2) They may be a direct extension from an adjacent osteomyelitis or cellulitis. (3) They may be blood-borne from a distant focus, such as an abscessed tooth or tonsil, a scratch on the foot or hand, to the synovial lining, where they form an abscess which ruptures into the joint cavity. Frequently the condition follows infectious diseases, such as measles, scarlet fever, pneumonia, meningitis, and it is a common complication of the pyæmias. It is to this third division, commonly called the metastatic group, that I wish to direct particular attention.

* A paper read at the Combined Meeting of the Canadian and American Medical Associations at Atlantic City, June 13, 1935; Section on Orthopaedic Surgery.

peritoneal or pleural cavity. Ankylosis is the feature of which one must always be mindful. The x-ray is of some assistance in this regard because from it we can form a fairly accurate idea of the amount of destruction that has taken place. Upon this feature more than any other is the prognosis dependent. If limitation of movement is going to occur the limb must be kept in the position most suitable to function.

In conclusion allow me to emphasize the early diagnostic use of the aspirating syringe. If the joint is drained before pathological changes occur in the articular cartilage resolution usually follows with little impairment of function.

REFERENCES

1. HARRIS, R. I.: Acute suppurative arthritis in children, *J. Bone & Joint Surg.*, 1925, 7: 849.
2. PHEMISTER, D. B.: The effect of pressure on articular surfaces in pyogenic and tuberculous arthritides and its bearing on treatment, *Ann. Surg.*, 1924, 80: 481.
3. PHEMISTER, D. B.: Changes in the articular surfaces in tuberculous and in pyogenic infections of joints, *Am. J. Roentgenol. & Radium Therapy*, 1924, 12: 1.
4. HENCH, P. S. AND SLOCUMB, C. H.: Results of fever therapy for gonorrhoeal arthritis, chronic infectious (atrophic) arthritis, and other forms of "rheumatism", *Proc. Staff Meet. Mayo Clinic*, 1935, 10: 202.
5. BLAKE, J. A.: The treatment of acute pyogenic joint infections, *Am. J. Surg.*, 1935, 39: 81.
6. ERB, K. H.: The modern treatments of acute suppuration of the knee joint: Laewen's operation as a method of choice in severe forms, *Beitr. z. klin. Chir.*, 1932, 155: 437.
7. WIART, P. AND MERALLIE, C.: Suppurative arthritis of the knee, healed without arthrotomy, with an excellent functional result, after injections of bacteriophage, *Bull. et mém. de la Soc. nat. de chir.*, 1931, 57: 234.

FRACTURES OF THE CARPAL SCAPHOID

By D. W. GORDON MURRAY,

Toronto

FRACTURES of this bone fall into two groups,

those through the articular surfaces in the region of the waist of the bone, and those involving the tuberosity. In the former group the line of fracture usually crosses about the junction of the proximal two-fifths with the distal three-fifths, but there are others through the proximal fifth of the bone. In this latter group the blood supply to the proximal fragment is likely to be impaired, making union by any closed method of treatment doubtful. The fracturing force in these is usually indirect violence, probably applied in the manner to be described presently. Those placed more distally, especially when the tuberosity is involved, are usually produced by direct violence to the area.

The articulation between the base of the middle metacarpal and the os magnum allows slight lateral movement and slight flexion, but on extension these two bones become locked, forming a rigid bar extending to the head of the latter bone. Then, pressure applied to the metacarpal in extension is transmitted through the head of the os magnum directly to the adjacent articular facets of the scaphoid and semilunar bones. With the wrist adducted the external collateral ligament of this joint is taut, thereby making the tuberosity of the scaphoid to which the ligament is attached a fixed point, while the proximal end of the scaphoid is sup-

ported by the lower facet of the radius, and the central part of the bone is unsupported. Now, if pressure is applied to the head of the metacarpals to force the middle one proximally to the ulnar side and into hyperextension, the force is transmitted through the head of the os magnum to the central part of the scaphoid, which is unsupported in this position and so may be fractured. Evidence to support this view was obtained on observation of a recent fracture with the fluoroscope, which showed the fragments separated when the hand was forced into the position described, and when placed in abduction the fragments were approximated. Adduction also swings the ridge between the semilunar and scaphoid facets on the head of the magnum into the hollow of the scaphoid, so that it acts as a special point of pressure opposite the unsupported area of the scaphoid. Also, the very strong volar ligaments of the carpus, especially those attached to the volar surfaces of the os magnum, just distal to its head, act as a fulcrum, causing the force to be applied as described. If the semilunar is dislocated by a force which tends to be more hyperextension, with less adduction, it leaves the scaphoid to bear all the force transmitted through the head of the os magnum, and this may account for some of the fractures occurring with this complication. In mid-carpal

dislocations probably it is the fulcrum represented by the volar ligaments which gives way, allowing the head of the os magnum with its distal row of bones and sometimes the cuneiform to be displaced. Clinical examination in the average case shows slight swelling over the radial side of the wrist, with limitation of the extremes of all movements, a weak grip, tenderness over the dorsal and palmar surfaces of the bone, also the anatomical snuff-box when the hand is adducted.

Skiagrams taken in the antero-posterior and oblique directions usually show the fracture. It is at this point, however, that the unwary may go astray and fail to see the fracture on the plates. If there is any doubt, and especially if the scaphoid appears foreshortened, other plates should be made to show the bone in a transverse view as nearly as possible. There are cases, however, in which a clinical diagnosis is easily made, but skiagrams apparently do not show the lesion; yet plates taken a few weeks later show the obvious signs of fracture. This is due to the rarefying osteitis following any fracture, which produces sufficient bone change to make the lesion obvious.

In fractures of the tuberosity there is rarely much separation of fragments, so that in our cases it was not necessary to do much manipulation in order to restore the fragments to good position. Fixation in plaster for three weeks with the wrist in moderate dorsiflexion and radial abduction gave union by bone in all our cases with excellent functional results.

In recent fractures through the waist of the bone usually there is no displacement of fragments. In this case, fixation in plaster in moderate dorsiflexion and abduction for eight weeks gave satisfactory union by bone in all our cases, and these results agree with reports by Bohler on 60 such cases. Watson Jones¹ has mentioned that fixation for longer periods up to twelve months is necessary in some cases. In our group, to date, it has not been necessary to extend the time beyond eight weeks in recent fractures. In cases however where the fracture has been untreated for weeks the time of fixation has been extended until there is radiographic evidence of union. When the fracture has existed untreated for months the period of disability has been shorter following open operation, and the prospect of bony union

is better than when fixation alone has been employed. Special care should be taken in applying the plaster to afford efficient support to the first metacarpal bone.

Occasionally, fracture through the waist of the scaphoid is accompanied by dislocation of the semilunar bone or by a mid-carpal dislocation. In the former the proximal fragment of the scaphoid is displaced towards the ulnar side, partly filling the space left by the displaced semilunar. If seen early the semilunar bone may be reduced, thereby improving the position of the proximal fragment of the scaphoid: when fixation may be expected to give a satisfactory result. If unreduced for a few weeks it is impossible to restore the semilunar to its place, even by open operation, in which case it should be removed, and if the scaphoid is fractured its proximal fragment should also be removed. In some cases a better functional result is obtained by removing both fragments of the scaphoid, the displaced semilunar, and the cuneiform, leaving the distal row of the carpus to articulate with the radius and the triangular fibro-cartilage. The wrist region, following this, has a shortened appearance, but the lateral deviation which follows excision of the semilunar and scaphoid is avoided.

When accompanied by a mid-carpal dislocation, closed or open reduction with immediate bone graft of scaphoid, if necessary, to hold the two fragments in good position, gave good results in our cases. In neglected cases of this sort removal of the scaphoid or of the proximal row of the carpus has given fair results. Fracture of the scaphoid sometimes accompanies a fracture through the lower end of radius, in which case support should be provided for sufficient time to allow the former to unite.

In neglected cases of simple fracture of scaphoid where non-union has resulted, the differential diagnosis should consider congenital bipartite bone from lack of fusion in the 6th year of the two chief centres from which the bone is ossified, and rarely, the os centrale may persist as a third bone. These anomalies are apt to be bilateral, so that x-rays of both sides may clear up the diagnosis. It has been suggested by Pfitzner² that most fractures of the scaphoid, and especially non-unions, are con-

genital subdivisions of this bone, which cause an inherent weakness in the wrist, and that some minor injury calls attention to the part and x-ray demonstrates the lesion. Dwight³ has found several congenital subdivided scaphoids, but thinks that fracture does occur.

Looking for some information on this aspect of the subject, I examined 304 dried specimens of this bone in the Department of Anatomy. The variation in size and shape of the scaphoid was worthy of note. In some the tuberosity and proximal half of the bone was separated by only a slight groove; in others there was a well defined and relatively long constriction about the centre of the bone in the position commonly described as the waist, giving this bone a considerably greater relative length. Comparing the cases of clinical fracture with these bones, it would appear that the fracture through the waist of the bone tends to occur in the longer bone with a fairly well defined waist. Some of the fractures through the proximal third of the scaphoid are exceptions to this.

In the 304 specimens there was one which showed a fracture of the waist, with the fragments in fairly good position and united by bone. One other showed great enlargement and irregularity of the tuberosity, which might have been new bone formed about a fracture here. There were two others with a spur of bone, 4 mm. in length, attached by a base 6 mm. wide to the medial margin of the distal part of the bone. There was no evidence of slipping on other bones and no reason to suspect any inflammatory change. It is possible, therefore,

that this spur might represent a deformity from abnormal ossification arising from the os centrale. There was no evidence in this group of lack of fusion of the various centres from which the scaphoid is ossified, so that while congenital anomalies do occur they are comparatively rare and usually can be identified by evidence obtained from skiagrams of the normal side. The time when a fracture of the scaphoid will not unite by closed methods of treatment (thereby falling into the class of non-unions) has not been determined. Doubtless, many fractures of many months' duration will unite if given sufficient time with adequate support, but in some cases this takes eight to twelve months. It has been demonstrated, however, in our group of cases, that following open operation the average time before returning to heavy work is 4½ months. Consequently, a fracture ununited within several months is treated by bone grafting. An incision is placed on the radial side of the wrist to expose the tuberosity of the scaphoid. A hole is drilled across the fracture line, beginning at the tuberosity. A peg of autogenous bone is made in the hole, acting as a graft, and at the same time binding the two fragments firmly together. With this form of treatment, in 16 cases, we have not had a failure, all the fractures having united by bone and the functional result has been excellent in all.

REFERENCES

1. JONES, W.: Inadequate immobilization and non-union of fractures, *Brit. M. J.*, 1934, 1: 937.
2. PRITZNER, W.: Die Variation im Aufbau des Handskelets, Schwalbe's Morphologische Arbeiten, Fisher, Jena, Band IV, 1895.
3. DWIGHT, T.: A Clinical Atlas—Variations of the Bones of the Hand and Foot, Lippincott, Phila., 1907, 4.

THE DANGERS OF VAGINAL DOUCHING.—H. H. Schmid draws attention to the widespread abuse of the vaginal douche and its attendant dangers. Regular douching is resorted to from motives of cleanliness—for example, after each period; it is commonly used as a contraceptive measure after coitus; and it is frequently employed to get rid of the "debilitating" effect of a leucorrhoeal discharge. None of these reasons are of themselves good or sufficient. Even when douching is indicated the physician should remember that in some sensitive women psychical trauma may result. Of the many solutions in use the author believes 1½ per cent lactic acid to be the best. Careful instructions with regard to the type of solution, its concentration, and the number of times it is to be used as a douche must be given, for much more harm than good is done by sup-

of the commonly employed chemicals in their more concentrated solutions. Schmid is of the opinion that "dry" therapy has great advantages over "wet" therapy. Dehydrating agents and antiseptics in tablet form are often more efficient in combating pathological vaginal flora than douches. The author especially condemns the balloon inflator douches of the clyster type. In many cases the hard nozzle has caused damage to the vagina or os uteri; air embolism is a frequent cause of death; peritonitis due to bacteria gaining access through the Fallopian tubes is a complication. In four cases in two years, more adduction, it leaves ing should not to bear all the force transmitted through the head of the os magnum, and this may account for some of the fractures occurring with this complication. In mid-carpal

SOME OBSERVATIONS ON SHORT WAVE THERAPY

BY R. B. TAYLOR, M.D.,

Montreal

AT the present time, when the profession is being approached to purchase new types of high frequency apparatus, it might be well to investigate some of the hyper-enthusiastic reports circularized by the manufacturers before buying any of these very expensive units.

For the benefit of those members of the profession who have been little informed in the physics of these machines, it might be well to point out the difference between the ordinary diathermy machine and the newer short wave and ultra short wave types. A very satisfactory classification has been made by the Council of Physical Therapy of the American Medical Association as follows: diathermy—for wave lengths down to 30 metres; short diathermy—for wave lengths from 30 to 12 metres; ultra short diathermy—for wave lengths from 12 metres down.

With the ordinary diathermy machine metal electrodes are placed in contact with the skin and mucous surfaces, and an electric current flows through the body from electrode to electrode. Here the current follows the lines of best conductivity, such as blood vessels, muscles, etc., and avoids as far as possible the less conductive parts, such as bone and fat.

The short and ultra short wave apparatus is similar to the ordinary short radio wave transmitter, the only difference being that the electrical energy, instead of being dispersed from the antenna, is confined between condenser plates. The electrodes, unlike those used in ordinary diathermy, are enclosed in glass or rubber, and do not come in actual contact with the skin surfaces; in fact some material such as a felt pad or thick bath towel is interposed in order to produce a space between the condenser and the surface to be treated. The heating effect in the case of diathermy is produced by conduction, while with short and ultra short waves the heating is due to dielectric losses in a condenser field. Thus, the heating effects would appear to be much more uniform in the case of short wave than with ordinary diathermy.

Two types of short wave apparatus are at present on the market, the spark-gap and the tube types, and there has been much controversy as to which type is the more efficient. Both types have certain advantages. As there are machines of both types that will generate sufficient high frequency energy for any therapeutic use, it would not appear to matter which type was purchased, provided it is one of the machines which have been endorsed by the Council of Physical Therapy of the American Medical Association.

As regards the wave length best suited for all round use there has also been much controversy, and much has been written about specific wave lengths for certain types of disease. In this case, as the heat produced is the therapeutic agent, it would not appear to matter what wave length is used. The heating effects of various types of machines have been compared by Mortimer and Beard, who concluded, after testing machines with wave lengths ranging from 6 to 25 metres, that there was no advantage of one wave length over another for heating purposes.

Apart from the fact that the literature extolling this new form of therapy would lead one to believe that we are already on the border of a medical Utopia, the statements made with regard to safety of the apparatus, freedom from danger of burns, and simplicity of application of electrodes, are liable to result in very serious consequences to the patient unless special care is taken. The physician is led to believe that anybody can be taught to use the equipment in a few minutes. In addition, because it is no longer necessary to fasten the electrodes carefully and smoothly to the skin surfaces, as with the old diathermy type of machine, he is given to understand that even application of the electrodes is not necessary. He is told that removal of clothing is not essential, since clothing, etc., is penetrated by the waves. Also, the treatment time is stated to be much shorter, allowing for treatment of a larger number of patients with resulting increase in income. And

lastly, he is told that the heating of tissues between the two electrodes is uniform.

That the apparatus is not absolutely safe or so simple of operation is borne out by the observations of Krusen and others. Electrodes coming in contact with one another, also insulated cables touching one another or a metal surface such as bed or table, have suddenly burst into flame. Even if the patient was comparatively uninjured, such an experience would be bad for all concerned. The insulated cables coming in contact with skin surfaces may produce almost as much heat as the electrode, and burns have resulted therefrom. Thus it is a matter of extreme importance to place the electrodes properly and to see that they are held in place by a rubber bandage or sandbag. The statement that burning of the skin cannot occur is very misleading and dangerous, as it is liable to cause the uninitiated operator to relax the caution he would exercise when using any other type of high frequency apparatus. Treatments given through the clothing are particularly liable to lead to disaster, as hot spots occur constantly in areas of moisture in the field between the two electrodes. Whenever the part being heated begins to perspire burning is likely, and even if the burn is relatively insignificant it is quite possible to find many patients with lowered heat perception who may receive burns of a serious nature. It is necessary to have the skin dry at all times, an impossibility when the patient remains clothed; and to accomplish this dry towels or layers of felt are placed next the skin. Lastly, because it is possible to heat the tissues with short radio waves in less time than with diathermy, we should realize that this is due to the greater energy output of these newer machines, and as a result should exercise greater caution in using them.

My personal experience with short and ultra short wave apparatus has been limited to the past 12 months, nevertheless some interesting results have been obtained. In reviewing the literature we find some very enthusiastic reports on the treatment of carbuncles, furuncles, abscesses, etc. Schliephake and others would have us believe that specific wave lengths have selective lethal action on various micro-organisms. This has not been borne out, at least on this side of the Atlantic. However, short waves have been very useful in helping Nature marshal her

forces against infection, and I have found healing to be effected much more speedily as a result of this new type of therapy. A few examples follow.

CASE 1

A young woman with a fairly large abscess on the gluteal fold was treated for 15 minutes with a 5-metre machine. Following the treatment the pain was increased for about 2 hours, after which time she experienced much relief. That evening the abscess opened spontaneously and discharged freely. The patient was given treatments on two successive days, after which time no treatment was necessary except the changing of dressings. Relief of pain, rapid drainage of the abscess, and speedy healing were the features of this case.

CASE 2

A young man with multiple furuncles on the back of his neck, extending into the scalp. Over two dozen were counted when he first presented himself for treatment. He had been under treatment for several months without freedom from the trouble. Improvement was marked from the first treatment, which was given with a 15-metre machine. During the past five months there has been no recurrence in the affected area, with the exception of an occasional single lesion which has responded rapidly to further short wave treatment.

Short wave therapy has been particularly useful in such conditions as neuralgia and neuritis. An example follows.

CASE 3

An elderly male with distressing neuralgia following herpes zoster was relieved by the use of a 15-metre short wave machine after every other type of treatment had failed. Recently, as the weather became colder, he had a slight recurrence. A single treatment was all that was necessary to relieve him of the pain and discomfort.

Favourable results have been obtained in the treatment of inflammatory affections of the pelvic organs. In one case the patient had been suffering for months with pain and discomfort. She was treated three times a week to begin with, and after five treatments felt so much better that she wanted to discontinue them. In nearly every case pain was relieved after four or five treatments and certainly long before any evidence of healing could be detected on palpation.

I have been particularly impressed with the relief obtained in sinus infections, and have had some very excellent results in chronic bronchial affections and asthma. There are many other conditions where short wave therapy has been extremely useful in conjunction with routine medical or surgical measures.

A great deal has been written on the results obtained in arthritis. I had expected much of short wave therapy in this condition, but must confess that I was unable to obtain any better results than with ordinary diathermy. Undoubtedly, exudative forms of arthritis respond

much better than rheumatoid forms, and as several of my cases were of the mixed type it is probable that I expected too much of it.

The object of this paper is not to present any special case reports, nor to attempt to point out either the good features or the shortcomings of this new type of treatment, but rather to bring to the attention of the profession a few facts that may assist them in determining what to purchase, if they desire to use short wave therapy, and also to caution them to use the apparatus with a great deal of respect after they have bought it. Unquestionably, in short wave therapy another very useful type of apparatus has been added to the field of Physical Medicine. It is to be hoped that over-enthusiasm and lack

of caution in using it will not react in such a manner as to cause condemnation of a method of treatment which, if properly developed, might open up new vistas in modern medicine.

BIBLIOGRAPHY

1. MORTIMER, B. AND BEARD, G.: Tissue heating by short wave diathermy, *J. Am. M. Ass.*, 1935, 105: 510.
2. KRUSEN, F. H.: Short wave diathermy, *J. Am. M. Ass.*, 1935, 104.
3. MORTIMER, B. AND OSBORNE, S. L.: Tissue heating by short wave diathermy. Some biologic observations, *J. Am. M. Ass.*, 1935, 104: 1413.
4. SCHLIEPHAKE, E.: Short wave irradiation: apparatus, technique and biological action, *Deut. Med. Wchnschr.*, 1932, 58: 1235.
5. SCHLIEPHAKE, E.: Ultra-short electric waves: A new development in diathermy, *Brit. J. Phys. Med.*, 1933, 8: 69.
6. SCHLIEPHAKE, E.: Ultra-short wave therapy, *Brit. J. Phys. Med.*, 1934, 8: 196.
7. KLING, D. H.: Results of short wave and ultra-short wave therapy, *Arch. Phys. Therapy, X-Ray, Radium*, 1935, 16: 88.
8. TURRELL, W. J.: First impressions of short-wave therapy, *Brit. J. Phys. Med.*, 1934, 9: 99.
9. COMPERE, A.: Short-wave therapy, *Brit. J. Phys. Med.*, 1933, 8: 101.

Case Reports

BACILLUS ACIDI LACTICI INFECTION OF THE STERNUM

By GEORGE D. LITTLE, M.D.,

Montreal

Early in March, 1934, Miss A. S., aged 74 years, suffered from what was taken to be a mild attack of "grippe". When the acute symptoms had subsided she felt some dull pain at night over the sternum, and noticed that there was a small area which was swollen. On April 7, 1934, I was invited to make an examination at her home. The previous history was negative with special reference to typhoid fever, but she had suffered from an uncomplicated pneumonia six years before, and her family history showed that one sister had died of tuberculosis.

Examination showed a bright and intelligent woman who looked considerably younger than the stated age. She was thin, but had always been so. There was no fever and the pulse was normal. Situated over the sternum, at the level of the third rib, chiefly to the left, was an elevated area about 4 cm. in diameter, and raised about 1 cm. above the surface. Over it the skin looked normal. There was some local heat. The tumour was firm, and its margin well defined. There was no acute tenderness. On deep palpation fluctuation was elicited. X-ray

examination suggested the presence of an osteitis of the sternum. There was no evidence of an intra-thoracic lesion.

On April 11, 1934, the surface became reddened, and blanched on pressure. Exploratory puncture under local anæsthesia was performed. The report of the pathologist reads as follows. "Aspiration obtained with the needle apparently on bare bone, produced a small amount of grey, thick odourless pus. Smears and cultures were made at the bedside. Differential stains of smears showed many polymorphonuclear leucocytes, both well preserved and degenerated, a few red blood cells and serum. No definite organisms seen. No tumour cells present. Special technique was used in preparing material to be stained and examined for tumour cells. Cultures were made at once on to a series of media, including that used in the isolation of the typhoid group. On arrival at the laboratory a series of agar plates was poured. From each of the various media inoculated at the bedside and from plates poured in the laboratory the same organism was found in pure culture. The organism — a Gram-negative non-motile bacillus — was identified by the characters of its growth and reactions on various media, including a series of sugars.

"*Diagnosis.*—Purulent material from a localized abscess; bacillus acidi lactici, the infecting organism, in pure culture."

On April 15, 1934, under nitrous oxide-oxygen anaesthesia, an incision was made over the tumour. About one drachm of thick pus was evacuated, and, on probing, bare bone was felt. Exposure showed a roughened area about two cm. in diameter which was devoid of periosteum. The wound was packed with gauze saturated with liquid paraffin, and smeared with "bipp".

During convalescence the condition of the patient remained good, and granulations slowly covered the bare area. On September 18, 1934, the wound had completely healed, and has remained so. No definite sequestrum was identified, either at the time of operation or afterwards.

The preliminary diagnosis of this case was bone tumour. The diagnosis of an inflammatory lesion was accepted when deep fluctuation was found, and when the findings of the laboratory investigation were obtained. The case is interesting because of (1) the difficulty of diagnosis; (2) the site of the osteitis; (3) the invading organism; (4) the probability that the acute illness was a systemic infection by *B. acidilactici*, complicated by a localized hæmatogenous osteitis of the sternum.

MECONIUM ILEUS

By SARA MELTZER, M.D.,

*Assistant Pathologist, Winnipeg
General Hospital,
Winnipeg*

The following is a case of intestinal obstruction in a newborn child resulting from inspissation of abnormal meconium. Only a very few reports of the condition can be found in the literature. To one not aware of the condition the course of events and causation are baffling, and the case is therefore considered worthy of record.

History.—The patient, a male infant, was born at term. The mother was a healthy woman who had had two previous pregnancies. The first baby died four days after birth from what was thought to be obstruction of the bowel, but there was no post-mortem examination. The second baby is living and healthy.

The pregnancy and labour in this case were normal. The baby took feedings, but shortly after birth it began to vomit and continued to

do so. At first the vomitus consisted only of mucus, later of dark brown fluid. Abdominal distension gradually developed. Intestinal obstruction was diagnosed and a laparotomy performed on the second day. The peritoneal cavity was found to contain large quantities of meconium but the site and cause of the perforation were not investigated. The meconium was of the peculiar consistency to be described later. A drainage tube was inserted and the abdomen closed. The child died 48 hours after its birth.

Post-mortem findings 16 hours after death: The body was that of a well developed male baby, 48 hours old. The abdomen was greatly distended, and there was a recent incision on the right side.

There was no evidence of inflammation in the peritoneal cavity. There were no abnormal bands or adhesions. The bowel was greatly distended, increasing gradually from the duodenum, to reach its maximum degree of dilatation in the ascending colon. Dilatation was present also in the transverse colon, but at the splenic flexure it suddenly stopped, and below this point the bowel was quite patent, though collapsed. The stomach was moderately distended with thin fluid. The bowel was filled with meconium of most unusual appearance and consistency. It was of a yellowish colour, thick and extremely tenacious, suggesting mucilage in consistency. Beyond the splenic flexure the bowel was empty and the mucosa showed no staining. At the hepatic flexure there was a tear on the anterior surface, producing a hole 3.5 cm. in diameter. The edges were slightly rolled and everted, and there was a thin line of hæmorrhage along the free edge. The perforation was at the site of the greatest dilatation, but the meconium had passed beyond this point and filled the entire transverse colon. Microscopic examination of the bowel showed no abnormality except hæmorrhage at the free edge of the tear. There was no inflammation and no necrosis.

DISCUSSION

No anomaly of the bowel, and no abnormal bands or adhesions were found to account for the obstruction and rupture of the bowel. The mucilaginous meconium obstructed the lumen of bowel, which gave way at one of the points of anatomical weakness, namely the hepatic flexure. The meconium, which had not passed beyond the

splenic flexure, should normally be near the anus at birth. Meconium is sterile until the third day, accounting for the absence of peritonitis. The next question to determine is the cause of the abnormality of the meconium. At the time of the post-mortem examination there appeared to be no clue to the condition. A paper by Kornblith and Otani¹ has since come to my attention, describing a similar case in which they found a congenital stenosis of the duct of Wirsung and attributed the inspissation of the meconium to absence of pancreatic juice. It is unfortunate that in our case the pancreas was not examined, nor was it saved, so we are unable to go back on our material. In a personal communication to Dr. William Boyd, Dr. Farber, of Boston, describes a similar condition occurring in twins who died at the age of 24 hours. In both, occlusion of the pancreatic duct and pancreatic acinar fibrosis were found. This would stress further the probability of a congenital anomaly as the causative factor of the condition. It is of interest to note that in the present case another member of the family died apparently of a congenital gastro-intestinal anomaly.

REFERENCE

1. KORNBLITH, B. A. AND OTANI, S.: Meconium ileus with congenital stenosis of main pancreatic duct, *Am. J. Path.*, 1929, 5: 249.

A CASE OF CALCIFICATION OF THE
GALL-BLADDER*

BY FRASER B. GURD, F.R.C.S.(C.),

Montreal

Cases of calcification of the wall of the gall-bladder are sufficiently unusual to make the very excellent picture obtained in this case worthy of publication. In addition, however, to the condition of the gall-bladder the case presented at least two other features of unusual interest, namely, the coincident presence of complete obstruction of the common duct, due to a mass of a very large number of stones, associated with a peri-appendiceal abscess. I have never had occasion to operate upon a patient in whom such an extraordinary packing of a very large common duct and singularly enlarged hepatic ducts with large and small gall-stones, was present. This will be described in the case report.

* From the Montreal General Hospital.

Mrs. J.H., (No. 4598/32), aged 67 years, was admitted to the Montreal General Hospital on August 15, 1932, complaining of severe pain in the right side of the abdomen, vomiting, jaundice, putty-coloured stools, dark urine, and a loss of thirty to forty pounds in weight during the previous five months.

She stated that her present illness dated back thirty-five years, at which time she had had an attack of severe abdominal pain, without jaundice. At this time, a diagnosis of gall-stones was made. For several years she was free from symptoms, but gradually attacks had become more frequent and severe. Five years ago she was admitted to the Royal Victoria Hospital with a diagnosis of cholelithiasis, but developed pneumonia while awaiting operation. From 1927 until March, 1932, she suffered but infrequent mild attacks of pain, which were accompanied by jaundice. These attacks lasted a day or less. Between attacks she had been free from digestive disturbance. In March, 1932, the attacks became more severe, more prolonged, and more frequent, so that she had been almost continuously ill up to the time of her admission. During this time she had frequently noticed that the stools were putty-like and that the urine was dark. The attacks of pain had not borne any relation to food. She had not employed alkalies for relief. She did not think that she had been unduly troubled by belching of gas. She stated that she had not vomited but that she felt nauseated. Experience had shown her the advisability of avoiding fatty foods. She had not been constipated. Since March she had lost weight, from one hundred and forty-nine pounds to one-hundred and nineteen pounds.

Her past history was irrelevant, except for the fact that in 1907 she was operated upon in the Montreal General Hospital for movable right kidney. This operation was followed by little or no relief. She had had eight children.

At the time of admission the patient looked ill, had evidently lost a large amount of weight, and was jaundiced. The right side of the abdomen was rigid and tenderness was acute, especially over the right side. At the time of her admission her temperature was 101°; pulse rate, 94. She was closely watched for a period of forty-eight hours, in the hope that the acute condition would subside prior to operation.

During this period morphine was necessary to relieve the pain.

As the condition did not subside, operation was undertaken, August 17th, under avertin anaesthesia, fortified by nitrous oxide and oxygen. A transverse incision was made across the whole of the right half and the medial half of the left side of the abdomen. Examination of the stomach and duodenum showed these organs to be normal. The gall-bladder was reddish-grey in colour; its wall was thickened, and upon palpation was found to crackle like a cracked egg shell. As radiological examination had already proved the gall-bladder to be calcified, this finding was not surprising.

Examination of the common duct showed it to be dilated to about the size of, and to feel not unlike, an ordinary candle, since it was tightly packed with stones from one end to the other. Prior to interference with the biliary tract, the cæcum was drawn up into the wound. When this was done an abscess, judged to contain approximately 40 to 50 c.c. of somewhat blood-stained purulent fluid, was evacuated. A small, somewhat hyperæmic appendix was lying in the centre of this abscess. The small bowel and cæcum in the neighbourhood were reddened and showed flakes of fibrin over the surface. The appendix was removed and the stump buried after cleaning the site of the abscess.

The cystic duct was identified without difficulty, and, using it as a guide, the common duct was opened. The opening into the duct was sufficiently large to easily admit the index finger. A very large number of stones, varying in size from 2 mm. up to 1.2 cm., were removed by means of a scoop. In this way a mass of stones, estimated to be approximately 60 c.c. in volume, was removed. The lower end of the duct was thus completely cleared, although it seemed to be impossible to completely clear the hepatic ducts. A large calibre T-tube was inserted into the duct and sutured into position. No attempt was made to close the large opening in the duct. Liquid paraffined gauze packing was placed down to the opening in the duct, so that a track approximately 3 cm. in diameter would exist down to it. This was done as it was believed to be certain that further stones would continue to be discharged from the ramifications of the hepatic duct in the liver. The

gall-bladder was removed after ligation of the cystic artery.

The patient stood the operation well. Subcutaneous Ringer's solution was administered during the course of the operation and glucose at its completion. The abdomen was closed in layers, the T-tube and paraffined packing being withdrawn through the lateral border of the wound on the right side. Her subsequent course was relatively uneventful. At no time did she vomit. A large amount of bile was evacuated through and about the tube, and daily, for a period of twenty-two days following operation, from six to thirty or more stones were evacuated on the dressings. The pack was removed three days after operation, which left a large opening. The tube was removed nine days after operation, days after operation, which left a large opening and the patient was out of bed on the thirteenth day. She was discharged from hospital September 17, 1932, thirty-one days after operation. At this time her general condition was good, her appetite was fair, the bowel movements were coloured, she was free from any evidence of jaundice, and a moderate amount of bile was being discharged from the sinus in the abdominal wall.

Since discharge from hospital this woman has been seen repeatedly, the last time, in March, 1935, when, despite her seventy years, she was found to be in excellent general condition, reported that she had been free from pain and other disturbances since 1932.

PRIMARY CORTICAL CARCINOMA OF THE SUPRARENAL

By N. S. SHENSTONE AND G. W. LOUGHEED,

*Department of Pensions and National Health,
Christie St. Hospital,*

Toronto

One encounters in the literature a very limited number of reports of primary tumours of the suprarenal. For this reason it seems worth while to place the following case on record.

N.W., male, aged 34, married, postal clerk, entered Christie Street Hospital on March 20, 1933. He gave a history of having enjoyed the best of health until three months before his admission, when he began to suffer with in-

creasing abdominal pain and a progressive loss in weight and energy. The pain was severe, aching in character and was located in the upper epigastrium. It was frequently accompanied by nausea, distension and belching of gas. It was unaffected by position or the taking of food or soda. The appetite was poor and the bowels usually constipated. He had lost fifteen pounds in weight and was easily fatigued. There had been increasing shortness of breath on exertion.

The patient was thin and pale. Under observation he had a continued slight elevation of temperature, and his pulse was usually somewhat accelerated. On admission his weight was 135 pounds. Inspection of the abdomen was negative, but when lying prone a slight rounded swelling in the left flank which moved with respiration was visible. On palpation the mass was tender and had the physical characteristics of a low-lying kidney. At a later date examination showed that the upper end of the mass expanded into a much larger swelling which was lost under the left costal border. The barium meal showed a "cascade" stomach, pressed forward by an underlying tumour. The splenic flexure was displaced downward. A pyelogram demonstrated a low left kidney in which the upper calyx was flattened.

The laboratory findings were as follows: red blood cells, 4,126,000; white blood cells, 18,000; differential white blood count: neutrophils, 63 per cent, lymphocytes, 19 per cent, endothelials, 7 per cent, eosinophils, 3 per cent, myelocytes, 3 per cent. Haemoglobin, 60 per cent. The Wassermann test was negative. The urine was normal except for a faint trace of albumin and an occasional pus and red blood cell on microscopic examination. The non-protein nitrogen was 40 mg. The cerebrospinal fluid findings were negative.

The diagnosis before operation was retroperitoneal tumour of uncertain origin, most probably hypernephroma.

Operation was carried out under spinal anaesthesia on May 11, 1933. A long left paramedian incision permitted the palpation of a rounded mass, the size of a large grape-fruit, placed behind the stomach and the splenic flexure and apparently springing from the upper pole of the kidney. The peritoneum immediately lateral to the descending colon was divided and

that structure, together with the tail of the pancreas, was retracted medially permitting a very satisfactory exposure of the anterior surface of the large, rounded, encapsulated tumour. The mass displaced the aorta to the right of the midline, but, except for fixation over a small area posteriorly, was easily separated from all the surrounding organs without haemorrhage. It was, however, in intimate relation with the upper pole of the kidney. As the posterior dissection could not be carried out under direct vision, the tumour, which was obviously cystic, was opened anteriorly and a large quantity of thick chocolate material evacuated. This permitted its complete removal without difficulty. The spleen, being about four times the normal in size and very firm on palpation, was also removed.

The immediate post-operative period was uneventful. Two months after operation the patient's general condition appeared improved, but he still complained of continuous pain in the upper abdomen. The pain was severe, aching in character, did not radiate, and was unaffected by the taking of food or by exercise. X-ray at this time showed no evidence of secondary disease in the spine. In August, 1933, he became slightly jaundiced, and urobilin was found in the urine. In December he began to suffer with dyspnoea, painful breathing and loss of weight and strength. Death occurred on January 31, 1934.

At no time during the course of his illness were there any obvious changes in his sex character.

Pathological report.—The gross specimen consisted of the shell of a cystic tumour, measuring 4 by 3¼ inches, which had been opened at operation and contained a small amount of chocolate-coloured material. The wall varied in thickness from 1¼ to ¼ inch. Incorporated in a thickened portion of the wall and seen clearly on cross-section was a remnant of the suprarenal gland. In microscopic sections from this area were seen the cellular structures normally found in the zona glomerulosa. Elsewhere the cut surface was dull grey in appearance, dotted with small yellowish areas and, under the microscope, sections showed numerous vesicular cells irregularly arranged. In some parts there was a tendency for the cells to grow in cords, while in others there was an apparent attempt at gland formation. In many places there was invasion of the capsule. A fat-stain applied to frozen sections demonstrated a large amount of lipid.

Diagnosis.—Carcinoma of the suprarenal cortex.

The complete post-mortem examination revealed metastases in the liver, peritoneum, retroperitoneal glands, lungs and mediastinum. The right suprarenal was normal. Frozen sections stained with fat-stain showed the lipid less marked in the secondary than the primary growth.

Editorial

PROBLEMS CONNECTED WITH DISEASE OF THE CORONARY ARTERIES

EVEN a cursory examination of contemporary medical literature will convince one that coronary disease, in particular coronary occlusion, is receiving much attention from the clinician, the pathologist, and the laboratory worker. This intensive study has laid bare new facts which not only serve to indicate the inadequacy of the older conceptions but also the complexity of the subject. Time was when the coronaries were thought to be "end-arteries" and that coronary occlusion meant instantaneous or at least sudden death. We now know that the condition may exist with absolutely no clinical manifestations. Between these two extremes there are many degrees of disability. The work of Spalteholz, Gross¹, Wearn and many others has proved conclusively that anastomosis in the heart is quite free. Gross' statement is that "the heart is perhaps the richest organ of the body as regards capillary and pre-capillary anastomoses between branches of the same coronary artery as well as between branches from both coronaries". More than one investigator, too, has shown that as need arises and with the advance of years new vessels are opened up and the circulation becomes to an extent more effective. We are prepared, therefore, for the statement that the effects of coronary occlusion may vary greatly in character, both quantitatively and qualitatively.

The problems that have been raised by the later investigations are not a few and by no means simple. What, for instance, is the exact relation of coronary occlusion to coronary sclerosis, to generalized arteriosclerosis, to hyperpiesia? While in the great majority of cases coronary sclerosis is associated with generalized arterial sclerosis exceptions occur. For example, arterial sclerosis may be generalized, except that the coronaries have escaped; on the other hand, the coronaries may be involved, to the ex-

clusion of the general arterial system. Why is this? On the clinical side, coronary occlusion may cause sudden death, a "typical" syndrome, an atypical picture in which one or more of the usual features may be lacking or, again, unusually prominent, or, and most curiously, there may be no obvious manifestations. Further, all the expected clinical features of coronary occlusion may be present but the coronary arteries may not be blocked. Why is all this? It is obvious that there must be a multiplicity of factors at work, the mutations and permutations of which are almost endless.

Occlusion of a major coronary artery is commonly due to thrombosis, which latter is dependent on coronary sclerosis, which in its turn is usually associated with generalized arterial sclerosis. On this matter, and the further possible relationship of these conditions to high blood pressure authorities differ. Allbutt and many others thought that high blood pressure leads to degeneration of the arterial walls (atherosis; sclerosis). Some recent observations may be referred to. Bell and Clawson² found that at autopsy 90 per cent of hypertensive patients were the subjects of coronary sclerosis. Duncan Graham³ brings forward corroborative evidence. In 100 cases of essential hypertension studied by him major symptoms of cardiac origin appeared first in 62 per cent and cardiac insufficiency developed in 37.7 per cent. He remarks that as essential hypertension develops most frequently after the age of forty arteriosclerosis of the main coronary arteries is a common accompaniment. Oille and Rykert,⁴ in a study of 3,240 post-mortems, in which they looked for coronary disease, have this to say. Taking the last 90 cases in which they found arterial or arteriolar disease, after a careful

1. GROSS, L.: *The Blood Supply of the Heart in its Anatomical and Clinical Aspects*, Paul B. Hoeber, New York, 1921.

2. BELL, E. T. AND CLAWSON, G. J.: Primary hypertension, *Arch. of Path.*, 1928, 5: 939.

3. GRAHAM, D.: The clinical diagnosis of arteriosclerosis and hypertension, *Canad. M. Ass. J.*, 1935, 32: 29.

4. OILLE, J. A. AND RYKERT, H.: The clinical manifestations of coronary disease, *Canad. M. Ass. J.*, 1935, 32: 35.

analysis, they found that 44.4 per cent had coronary thrombosis; 21.1 per cent had infarction of the heart without thrombosis; and 34.4 per cent had coronary disease without thrombosis. They say "A higher percentage of the uncomplicated coronary sclerosis groups (degenerative myocarditis) had hypertension than had the cases of cardiac infarction or coronary occlusion. Approximately 80 per cent of the cases of degenerative myocarditis had hypertension, while only 35 per cent of the cases of recent infarction had hypertension." They think that part of this difference can be explained by the fact that coronary occlusion lowers the blood pressure, and many of this group had had high blood pressure previously.

Oskar Klotz, a recognized authority on arteriosclerosis, is contrary-minded, however. He says⁵ "There is as yet no evidence to shew that the ordinary types of arteriosclerosis have a relation to hypertension". He cites a case of hypertension in a young man in whom the walls of the coronary arteries were found to be merely hypertrophied. It might be argued here that had his patient lived longer frank degenerative changes might have been present, for it is a well recognized pathological principle that strain on the tissues may in time produce fibrosis (a precursor of degeneration. See Adami⁶).

Christian, also, in a discussion on a paper by Smith, Paul and Rathe⁷, stated that "arteriosclerosis in general probably has no bearing on heart disease". Who shall decide when experts differ? It has been suggested, it may be added, that arterial sclerosis is due to a disturbance of cholesterol metabolism, to add a little more uncertainty.

The lesions associated with coronary disease are somewhat varied and not altogether predictable. Where the coronary arterioles are narrowed the myocardium corresponding to their distribution will shew numerous small fibrotic patches which have replaced atrophied and lost muscle fibres (degenerative myocarditis, so-called). Where larger trunks are involved recent occlusion

of a grosser character may be found, usually thrombotic, superimposed on antecedent fibrotic myocardial degeneration. Here we may get a mural infarct. Saphir and his associates,⁸ in a study of 34 cases, found recent thrombi in 18 and organizing or organized thrombi in 14, proving that attacks of coronary thrombosis may be recurrent.

The scleroses have an irregular distribution in the vessels, some of them being found in the main trunks and others being scattered along the finer ramifications which penetrate the cardiac muscle more deeply. In cases where occlusion of a major coronary artery had occurred Moritz and Beck,⁹ in a study of 94 human hearts, found the location of the lesion to be as follows: left coronary only, 54 per cent; right coronary only, 13 per cent; both, 33 per cent. The divisions most commonly occluded were the descending ramus of the left coronary artery in 72 per cent; the circumflex portion of the right in 42 per cent; and the circumflex portion of the left in 12 per cent. The lesions, therefore, are most commonly found in the wall of the left ventricle near the apex, less often near the junction of the upper and middle third, and less often still in the septum. In the rare event of an attack of so-called "angina" in the absence of recognizable coronary lesions we probably have to invoke the old doctrine of coronary spasm.

The effects of coronary occlusion on the heart muscle itself and the clinical features evoked thereby are dependent on various and variable factors—notably, the size of the obliterated vessel; its location; the duration of the occlusion and the rapidity with which it occurs; the effectiveness of the general circulation; the quality of the cardiac muscle (dependent on such matters as heredity, youth, and previous infections) and the age of the patient. These factors may vary in their incidence, their relative prominence, and their combinations, so that it is small wonder that the clinical features of coronary disease present so many differing and puzzling aspects. A. G. N.

5. KLOTZ, O.: Concerning the pathology of some arterial diseases, *Ann. of Clin. Med.*, 1926, 4: 814.

6. ADAMI, J. G.: Principles of Pathology, Lea & Febiger, Philadelphia, 1910, p. 452.

7. SMITH, F. M., PAUL, W. D. AND RATHE, H. W.: Significance of the coronary circulation in arteriosclerotic disease, *Trans. Ass. Amer. Phys.*, 1934, 49: 167.

8. SAPHIR, O., PRIEST, W. S., HAMBURGER, W. M. AND KATZ, L. N.: Coronary arteriosclerosis, coronary thrombosis, and the resulting myocardial changes, *Amer. Heart J.*, 1935, 10: 567 and 762.

9. MORITZ, A. R. AND BECK, C. S.: The production of a collateral circulation to the heart, *Amer. Heart J.*, 1935, 10: 874.

CAN THESE THINGS BE? A PLEA FOR PHYSICAL CULTURE

AT the Annual Meeting of the Saskatchewan Medical Association, held in Moose Jaw last September, Dr. V. E. Black, of that city, made a powerful plea for more physical culture in our schools. He gave his address the arresting title "Can These Things Be?" We are satisfied that Dr. Black has shown, not before it was needed, a red light on the highway of our present-day scholastic education, of which we may well take heed.

Dr. Black was watching a procession of school children with their teachers taking part in the recent Jubilee Celebration. It was impressed upon him that not more than 10 per cent of them knew how to breathe, walk or stand correctly. They had arrived in this world with a full complement of parts, perfect little physical machines, and yet not one in ten moved with that free, swinging, effortless walk that is a joy to behold. Further, at least every third child was out of step, manifesting a lack of that sense of rhythm which is so essential to efficiency in more than one walk of life. This "sloppiness" of gait and posture connoted encroachment on the space intended for the heart and lungs, and could only spell subnormal vitality. As might be suspected, the teachers were little better. Dr. Black comments that it will only be a matter of time when our citizenry will be composed of physical degenerates. That this thought is more than a mere guess is shown by the fact that 75 per cent of our young men and women carry some physical defect which might have been prevented. Dr. Black suggests that it is probable "that the reason so many of our young men and women seek stimulation, excitement and thrill, with sex a predominant factor, is because they lack the necessary body stamina to seek enjoyment in more strenuous pursuits". Pursuing a similar line of thought, we may call attention to the fact that a large proportion of our younger members take their athletics vicariously, by watching paid performers in hockey, football, and the like. As a further proof that we are raising a crop of weaklings, we need only cite the now well-established fact that a very large proportion of the students in

our universities and of the nurses in our hospitals are the subjects of tuberculosis. Granting that other factors come into play here, such as herding together, bad ventilation, and a greater opportunity for being exposed to infection, we can hardly doubt that the bodily stamina of these people is and has been below par, for infection with tuberculosis is nearly always acquired in childhood and early youth. All this could have been prevented. Even an outdoor life is not enough. Dr. Black remarks that the average farmer whom he sees in consultation "knows less of good and proper breathing" than any class with which he comes in contact. "The average farmer or out-of-door worker will show you a beautifully muscled back, and in most cases no front chest to balance it, which means diminished heart and lung room, and in nine out of ten cases that back will not have more than 50 per cent of the range of movement it should have." Even doctors allow their abdomens to get fat, their feet to get weak, their wind to get short, and their muscles to get flabby. Should these things be?

In pursuing his theme Dr. Black points, rightly, to the example of the ancient Greeks. With them the cult of beauty was supreme—beauty in soul, beauty in body, beauty in art. *Mens sana in corpore sano* was their ideal maxim. The *asklepia*, for which they were renowned, were much more than hospitals; they were "preventoria". In their zeal for "fitness" the Spartans threw their weakly and deformed children over the city wall. We cannot now do this (on the contrary, we are promoting the survival of the unfit), but we might, at least, aim at a return to the ideal of the Greeks. How can this be done? First of all, by striking a proper balance among the things we teach our children. Dr. Black asks, very pertinently, whether we are not "spending too much money in elaborate and expensive methods when we attempt to teach first-rate minds in third-rate bodies". He would introduce sound physical education in our public schools. Something might be done in this direction with little or no apparatus. Dr. Black mentions cadet training. This

would inculcate obedience and leadership, and something of that sense of rhythm that he would develop. We would add, encourage the formation of Boy Scouts and Cubs and Girl Guides. Such training is of almost inestimable value. Also school sports should be cultivated. Dr. Black makes a useful suggestion, which is, that a list of normal measurements should be kept in schools and the children, on entering school, should be compared with this standard. Where any fall short they should be informed of the matter and given the reasons why they have fallen short. Instruction should then be given by the teachers to remedy the defects. The child should be expected to pass, or at least try to pass, examinations in physical development as well as in the usual mental branches.

In view of the close contact which the medical profession has with the community it is desirable, also, that it take the lead in advocating changes along these lines, campaigning for a better physique among the young people. This is a kind of preventive medicine which would be well worth while. As Dr. Black points out, a large proportion of our chronic diseases, some of the arthritides, many digestive disturbances, much of our circulatory troubles, and many nervous disorders are due to poor body mechanics. If preventible, why not prevent them? If we may compare, as Dr. Black does, the body to a machine, with its fulcrum and levers, its heat-production system, its power plant, is it not commonsense to demand that that machine shall be kept running smoothly and efficiently. Should this thing not be? A. G. N.

Editorial Comments

Bibliographies

According to the technical definition a bibliography is a complete list of all that has been written on a subject. The term, however, is quite commonly, though perhaps a little loosely, used to designate all lists of references whether they be exhaustive or not. There is no great objection to this, although perhaps the shorter lists might be called "references", reserving "bibliography" for the more comprehensive ones. But that is a small point. The really important thing is the accuracy and form of these bibliographies. Every medical editor realizes the difficulty of the problem they present, but our readers should also have some appreciation of it.

Do we need bibliographies in journal articles at all? Most certainly, yes. Gone are the days when writers could say all they wanted without ever mentioning anyone else's work at all. Nowadays the difficulty is to decide whose work to select. The literature on most subjects is almost beyond comprehension. And it is by no means enough merely to say that Jones did or said so and so. Often we would like to know more about Jones' work, and where to find it. Besides, a careful bibliography—not necessarily exhaustive—confers on a paper the distinction which only thoroughness gives. We speak of a paper as being scholarly in direct proportion to the care and labour that has been bestowed on it, and a good bibliography is strong presumptive evidence of such labour.

That is the case for bibliographies. What

do we ask in their preparation? There is really but one thing needful, and that is accuracy. An incorrectly cited reference is much worse than useless. It is slovenly, and it can be irritating beyond all description. We do not know offhand that anyone has ever investigated the proportion of inaccuracies that appear in the average bibliography. It would be a back-breaking inquiry, but judging by our editorial experience in papers submitted for publication there would be no lack of errors to be recorded. Now, only one person is responsible for his bibliography and that is the author himself. No editor ever should, or ever will, verify references. The average paper gives him quite enough else to do. But the editor quite reasonably may ask that the references be not only accurate but arranged in a definite form. Most unfortunately, there is no standard form, except what each journal sets for itself. Compare any six good journals and see what variations they present. One insists on using Roman numerals for the volume number, another prefers Arabic; the full titles of papers are quoted by some and are left out by others; some quote initials of authors and others do not; some insist on the number of pages in a given article being mentioned; some put the bibliography at the end of the paper, others scatter references in footnotes. If anyone dislikes uniformity he should be entirely satisfied with the present methods of publishing bibliographies in medical journals! In our own Journal we ask contributors to follow the arrangement outlined on page iv of each number.

It is possible, however, to have too much even of a very good thing. Bibliographies may be the root of a paper, but the root must not be allowed to displace the tree. It is a question whether all long bibliographies are equally essential or deserve to be added to our heavily overloaded literature. It is well known that there are already many of them scattered through the journals, and a very comprehensive guide to the literature on a subject may be made up of only a few well chosen citations. We have enough reduplication of writing as it is.

To those interested in this apparently small detail we warmly recommend Dr. J. F. Fulton's excellent address on "The Principles of Bibliographical Citation".* Dr. Fulton's demands are exacting, his criticism severe; and nothing is more to be desired if our standards of writing are to be not only maintained but raised yet higher.

H.E.M.

The Study of Arthritis

All doctors interested in the problems involved in the study and treatment of arthritis are invited to be present at a preliminary organization meeting, to be held in the Library of the Daly Building, Ottawa, on February 14th, at 2.00 p.m.

There is an International Association at present, with headquarters at Amsterdam, with branches throughout Europe and America, and it is proposed to set up a similar branch in Canada, which will be directly associated with the Canadian Medical Association, whose Executive has intimated its approval of the suggested action of the temporary Committee, which was formed in January, 1935.

The answers to the questionnaire sent out by the temporary Committee last Spring were overwhelmingly in favour of the institution of an organized effort, and any doctors in Canada who were not reached by that questionnaire are also invited, either to be present themselves, or to send their comments on the general points involved to Dr. W. S. Barnhart, Medical Arts Building, Ottawa, Temporary Secretary, who will also be glad to answer any enquiries by mail.

The general plans to be followed will be those recommended by the Arthritis Committee of the British Medical Association.

ROSS MILLAR, M.D.,
Temporary Chairman.

W. S. BARNHART, M.D.,
Temporary Secretary.

This important matter is commended to the earnest attention of the profession [Ed.].

* *Bull. of Med. Lib. Assoc.*, 1934, 22: 183.

Dr. Maude Abbott's Atlas

The American Heart Association announces that it will publish the "Atlas of Congenital Cardiac Disease", now under preparation by Dr. Maude E. Abbott of McGill University. The book has been expanded from fifteen to twenty-five plates, containing over two hundred cuts with a handsome frontispiece. It now presents a comprehensive survey of the development and comparative anatomy of the heart in correlation with various cardiac defects, followed by a practically complete pictorial review of the entire range of cardiac anomalies of clinical significance, grouped under the author's classification, the roentgenological and electrocardiographic appearances being featured also whenever possible. It will contain some 75 pages of text and illustrations, forming a volume 11 x 14 inches in size, attractively bound with gold lettering.

TABLE OF CONTENTS

Frontispiece. Portraits of Senac, Morgagni, Peacock, Rokitsansky, and Sir Arthur Keith.
Introduction.

PART I. EMBRYOGENESIS.

Plates I. to III. Development and Comparative Anatomy of the Heart
Plate IV. Diagrams showing Arrest of Development (reversed torsion)
Plate V. Clinical Classification of Cardiac defects

PART II. CARDIAC ANOMALIES.

Group I.

Acyanotic Cases (No Abnormal Communication)

Plate VI. Coarctation of Aorta. Historic cases
Plate VII. Coarctation of Aorta. Recent cases
Plate VIII. Anomalies of Great Vessels of the Arch
Plate IX. Anomalies of Great Vessels entering Coronary Sinus
Plate X. Anomalies of the Heart as a Whole
Plate XI. Displacements of the Heart
Plate XII. Bicuspid Aortic Valve
Plate XIII. Other Anomalies of the Endocardium
Plate XIV. Pulmonary Stenosis with Cardiac Septa closed

Group II.

Cases of arterial-venous shunt (Cyanose tardive)

Plate XV. Patent Ductus Arteriosus
Plate XVI. Defects of Auricular Septum and Patent Foramen Ovale
Plate XVII. Defects of Ventricular or Aortic Septum

Group III.

Cases of Permanent venous arterial shunt (Morbus coeruleus)

Plate XVIII. Symptomatology of Congenital Cyanosis
Plate XIX. Cor Triloculare Biatrimum and Biventriculare
Plate XX. Cor Biloculare and Persistent Truncus
Plate XXI. (A) Pulmonary Stenosis with closed Ventricular Septum and Patent Foramen Ovale
(B) Defect Ventricular Septum with Dextro-position of Aorta
Plate XXII. Pulmonary Stenosis of Atresia with Defect Ventricular Septum (Tetralogy of Fallot)

- Plate XXIII. Pulmonary Atresia with closed Ventricular Septum, Aortic, Mitral, and Tricuspid Atresia
- Plate XXIV. Complete Transposition with Defect of Ventricular Septum
- Plate XXV. Complete Transposition with closed Ventricular Septum

The book is being issued by *advance* subscription, and it is planned to have it ready for circulation about March 15, 1936.

We urge all those desiring copies of this valuable publication to send their orders with cheques for \$5.50 (which includes the cost of packing and postage) to the American Heart Association, 50 West 50th Street, New York, N.Y., as soon as possible, and not later than March 1, 1936.

Retrospect

MILESTONES IN THE RECENT DEVELOPMENT OF OUR KNOWLEDGE OF HEARING AND BALANCING*

By W. J. McNALLY

Montreal

At the first meeting in history of two of the national societies of North America it is fitting to outline some of the recent fundamental contributions which have been made to our specialty, particularly when so many of them have come from America. You will note that the advances to which I shall refer are from only one department, namely, the ear, and for the most part they are not clinical. Clinical progress must be preceded by accurate knowledge of anatomy, physiology and pathology. Because of insufficient and inaccurate knowledge of these basic sciences otology has been almost at a standstill for thirty years.

Experimental investigation of the labyrinth flourished during the first quarter of the twentieth century. This was in large part due to the stimulating effect of the work of Sherrington, Magnus and de Kleijn, and Barany. With the beginning of the second quarter of the century, in America at least, this popularity of the labyrinth gave way to study of the cochlea. I believe the change was in large part due to the formation by the American Otological Society of a committee for the study of otosclerosis; and to the discovery by Wever and Bray of an improved method of recording an animal's hearing.

BALANCE

At the beginning of the century, Sherrington was carrying out his experiments upon the mechanism of bodily posture and reflex activity, which are now numbered among the great contributions to physiology. Simultaneously, but in their respective laboratories, he and Magnus discovered that animal posture is influenced by the labyrinth. Magnus and de Kleijn and their co-workers analyzed the labyrinthine reflexes concerned with posture and attempted to localize them to their origin in the different parts of the

organ. Furthermore, they distinguished, described, and localized many associated reflexes which also effect posture but which are non-labyrinthine in origin, such as neck reflexes and body-righting reflexes, etc. These had previously been confused with labyrinthine reflexes. The work carried on in these two laboratories attracted students from many countries so that a widespread revival of interest in labyrinthine function followed.

Barany's description of the caloric test in 1907 coincided with the experiments described above and stimulated interest, particularly among clinical otologists. A great obstacle to progress in labyrinthine physiology has been the difficulty of effecting clear-cut ablation operations on the individual end-organs. The difficulty increases as one mounts the scale to the mammal. In view of this the experiments of Maxwell, of California (1922), on the dogfish are an outstanding accomplishment. He has performed successful ablation operations on the individual canals and otoliths, and has analyzed the function of the different end-organs. As this work is repeated by subsequent investigators, I believe that his conclusions will be generally supported. In Montreal we have succeeded in carrying out differential ablation operations on the frog's labyrinth, and in many respects our conclusions confirm those of Maxwell. Versteegh, of Holland, has succeeded in doing differential ablation operations on the rabbit's saccule and utricle, but not on the semicircular canals.

Parker, of Harvard, working at the beginning of the century on the fishes' labyrinth was the first to demonstrate that in fishes the saccule is probably a vibration receptor. He and many others have practically established that the saccule has no vestibular function. Recently, Ross, in fishes, Hallpike, in the frog, and Ross and McNally, in the frog, have recorded action currents from the saccular nerve, and find that the saccule responds more to vibration stimulation than it does to movement or change of position. In spite of all these stimulating contributions the mechanism of the labyrinth is little understood, and it is still very doubtful what purpose parts of it serve. Its detailed connections are scarcely known. Is it any wonder that clinical progress is slow? Lack of this fundamental knowledge interferes with the proper interpretation of the vestibular tests.

*The Canadian Chairman's Address at the Combined Meeting of the American and Canadian Medical Associations at Atlantic City, Section of Laryngology, Otology and Rhinology, June, 12, 1935.

THE HEARING MECHANISM

The study of the hearing mechanism has been greatly impeded because of the difficulty of testing hearing in animals. Motor responses to sound, such as turning of the head in the direction of the sound and pricking up of the ears, etc., were for a long time the only criteria of an animal's hearing, but as they are so unreliable little progress could be made. It remained for Pavlov to develop conditioned reflexes. He found that conditioned reflexes to sound can be established in a dog and that this is a fairly accurate method of assessing an animal's hearing. This new method opened up new possibilities for research in the function of the cochlea. Pavlov's work was known for some time, but his book was not translated into English until 1927. His method is being modified and adapted to other animals, but is a time-consuming procedure and has very definite limitations.

Wever and Bray, of Princeton, in 1930, described an electrical method of recording an animal's hearing. The details of this procedure are well known to you all. This method, though complementary to the conditioned-reflex method of testing hearing, has some distinct advantages. It has been taken up and used in the study of cochlear function in the laboratories of most of our leading universities.

About the year 1926 several forces combined to spread a wave of experimental investigation of the cochlea over America. One of the most important causes was the formation, by the American Otological Society, under the leadership of Dr. Arthur Duel, of a committee to encourage the study of otosclerosis. In addition to collecting, translating and summarizing all literature on otosclerosis since the eighteenth century they have encouraged workers, both financially and otherwise, in Europe and America.

In 1924 Crowe, of Baltimore, began an extensive clinical and pathological investigation of patients admitted to the Johns Hopkins Hospital. A complete hearing test was done upon every possible patient in any of the hospital services, and irrespective of whether or not there was a history of ear trouble. Under Guild's direction, the temporal bones from all patients going to autopsy have been sectioned serially. The result is that an increasing number of temporal bones are being sectioned in which there is a record of

the hearing tests, and in many instances there is a complete record of the physical condition of the patient. They are accumulating in Baltimore a veritable library of this histological material with complete case records in many instances. Much of the material is from so-called normal patients, so that they will be able to arrive at a truer conception of the normal. The working up of this material is just in its infancy, but already Drs. Crowe, Guild and their collaborators have made many valuable contributions of new facts and have contradicted many old fallacies.

The construction of a standard audiometer by the Western Electric Company has done much to make possible the comparison of results of hearing tests from the various laboratories and clinics. They have also developed a special audiometer for the group testing of school children. The audiometer does not supplant the other methods of testing hearing, but it is a most valuable supplement to them.

The American Federation of Organizations for the Hard of Hearing was organized by the late Dr. Wendell C. Phillips in 1919. The object was to promote the various interests of the adult deaf. This movement has been much encouraged by otologists, and by 1926 there was a branch in nearly every city in America. As an outgrowth of this movement, great interest has been aroused in the early detection of deafness, and with the advent of the group-testing audiometer in 1926 the testing of hearing in school children has become routine in all large centres. Greater efforts are being made to detect ear trouble in the pre-school child in order that diagnosis may be made and treatment commenced as soon as possible.

A good example of the widespread interest shown by American otological investigators in the function of the cochlea is the symposium on the function of the apex of the cochlea, which was held by the American Otological Society at their meeting in Toronto a few weeks ago.

With improved methods of testing hearing both in animals and in men, with the group testing of school children to detect early deafness, with clinico-pathological investigations being carried out on an extensive scale, and with important contributions being made to physiology, I believe the story of otology will largely be rewritten in the next decade.

THYROID EXTRACT IN SLOWLY HEALING FRACTURES. —König has found the basal metabolism below normal in several cases in which fractures were slow to unite. At his hospital in Leipzig, in the course of two and a half years, only 5 cases were seen in which the slow formation of callus was associated with a normal or slightly raised basal metabolism. In a series of controls, whose fractures healed at the normal rate with callus formation, the basal metabolism was normal. These observations led the author to suspect that basal metabolism plays a certain part in the healing of bony lesions and that the local metabolism at the seat of a fracture may be slowed down if the basal metabolism is below normal.

He therefore gave large doses of thyroxine daily to patients whose fractures were healing slowly and whose basal metabolism was below normal. The thyroid preparation most satisfactory for prolonged medication is elithyran, given in tablet form and pushed till the basal metabolism becomes normal. One of his patients suffered from a fracture of the leg which failed to set after five months' treatment. The basal metabolism was about 20 per cent below normal. It was raised to 30 per cent above normal by two tablets of elithyran given three times a day. After a month the fracture had set firmly. —*Münch. med. Woch.*, May 30, 1935, p. 862. Abs. in *Brit. M. J.*

Special Articles

GIVERS OF LIFE*

BY GRANT FLEMING, M.D.,

Montreal

Individually and collectively, we experience certain justifiable satisfaction in a turn of events which establishes the soundness of our judgment. Today, those who in the past years have supported public health work have a right to feel that their judgment was unusually sound.

The humanism of the eighteenth century was altruistic, and expressed itself in adherence to such religious leaders as John Wesley, who expressed his belief that "Christianity is essentially a social religion". Christian humanism sought practical expression. The responsibility of the state for the care of the less fortunate members of society came to be accepted, and the physical welfare of mankind was not overlooked by those who were convinced that starvation was not necessarily the basis of wisdom or virtue. There is nothing more effective in the preservation of life than collective humanism.

Public health evolved during the nineteenth century as part of the social reform movement which had begun in the previous century. A sanitary conscience was engrafted on a religious revival. Jeremy Bentham and Robert Owen, two stalwart social reformers, were largely responsible for inspiring and training those who became the public health leaders of their day, notably Edwin Chadwick. The industrial revolution which brought the factory hands to live and work in the dreary and filthy barracks of the new industrial towns also made them dependent upon the uncertain wages of industry. Those who sought to lift the crushing burden of disease from the shoulders of the masses, in the light of the medical knowledge of the times, directed their attention to what we would call sanitation.

Conditions change, and many of the facilities which we now accept without question were unknown even fifty years ago. The interests of health and the interests of common physical convenience are often identical. Filth and rubbish may become mechanically inconvenient, as well as causing an insanitary condition which provides a breeding place for flies and rats. There is nothing romantic about sewers, water-purification plants, or garbage dumps. Nevertheless, a sanitary environment is essential to the welfare of mankind. The truth of this has been somewhat overlooked on this continent, as attention has been diverted to the much more

appealing problems of child health. It is well that the past few years have witnessed a revival of interest in housing, which aims to provide a dwelling so constructed and so situated as to make possible the creation of a healthy home, with the necessary playground and other facilities to meet the environmental health needs of the people. As an expression of humanism public health could not have gone far without the knowledge which medical science has made available, and upon which it was possible to build a sound public health program of disease prevention and health promotion.

Disease prevention naturally comes first, and no one will deny that we, in our generation, enjoy greater freedom from disease than has any previous age or generation. Not all of this progress is due to public health as such. Progress in disease prevention is dependent to a considerable extent upon the social evolution of the people. The Roman baths were designed for pleasure, not health, and the present relatively high standards of personal cleanliness owe much to the manufacturers of bathroom accessories, the hot-water boiler, the heated bathroom, and the use of cotton and silk underclothing. The lack of these was, no doubt, a potent influence in limiting Queen Elizabeth's baths to one a month, whether she required it or not. The contribution of public health measures is clearly seen in the comparatively greater freedom from preventable diseases enjoyed by those communities which have, over a period of time, expended reasonable sums on their public health services.

Why, it may be asked, is there this difference in the public health services of the various parts of the country? The difference exists chiefly because one area is more willing than another to contribute through taxation the moneys required to purchase that freedom from disease and greater measure of health which are possible only when organized community public health services are provided. Willingness to pay for public health usually comes with an understanding based upon education, which brings conviction to the taxpayer that, if on no higher grounds than that of self-interest, public health expenditures are a paying investment—good business.

Public health has progressed as far as it has largely through the inspiration and leadership of lay persons associated with voluntary health groups, such as the Public Health Committee of the Life Insurance Officers Association, who have accepted guidance in the scientific aspects of the subject from qualified sources. This leadership has been successful because, in general, its guiding principle has been that the care of the public health is a state responsibility,

*An address given at the annual meeting of the Canadian Life Insurance Officers' Association, at Toronto, November 22, 1935.

and that this responsibility can be met only when public health departments are organized under qualified leaders with adequate funds at their disposal. There must be no let-up in this educational work which aims to bring to every Canadian citizen the benefits which are attained through public health services. The very fact that a body such as this has supported public health in so tangible a manner is one of the most convincing arguments to present to the public of the proved value of public health services.

The progress which has been made in the control of most of the preventable diseases should furnish all the inspiration necessary to attack the problems which remain. In some cases we must await a further advance in medical knowledge to make this possible; in others, the knowledge is available, but we are leaving it practically unused. Think of what has been done to eradicate diphtheria! Are you not proud of the fact that we, in Canada, are making intelligent use of the knowledge which has been given us, with the result that diphtheria is fast disappearing from our midst? Why should we not deal with syphilis in the same intelligent manner? The venereal diseases are the greatest communicable disease problem existing in Canada, compared with which diphtheria is as nothing. Syphilis is still the killer of the race, and, as a misery producer, gonorrhoea remains unrivalled. We do not attack syphilis and gonorrhoea as the communicable disease problems which they are because we allow our emotions rather than our intelligence to dictate our attitudes. We think we are very modern in our attitude towards sex matters, but we need to be reminded that the Royal Commission in Great Britain reported among its findings, in 1916, that morality is not encouraged by denying medical treatment to those who, by violating the moral law become a public danger. I am not suggesting to you that syphilis or gonorrhoea become the subject of dinner-table conversation. I do suggest to you that we would be well advised to promote a public health program for the control of these two communicable diseases which are, without question, a far greater menace to human life, efficiency and happiness than is any other communicable disease.

Success in dealing with any one disease or group of diseases is made possible in the first place by medical science. Public health has the responsibility of bridging the gap between knowledge and practice. In certain instances, this can be accomplished through measures dealing with such inanimate things as water and milk, or else by the control of insects which act as the spreaders of certain diseases.

Most of the communicable diseases which are common in Canada belong to the group which is spread mainly by the transference of nose and throat secretions from one individual to another in the acts of coughing, sneezing, spitting and vigorous talking. Isolation and quarantine can-

not effectively control this group. Success has been achieved in diphtheria by building up the immunity or resistance of the individual. It may be that real control of these upper respiratory infections will not be attained in any other way than through individual immunizations. While awaiting the scientific knowledge to make this possible, much can be done through individual action to minimize the spread. The habits of life of the individual and of those with whom he comes in contact either facilitate or hinder the spread of disease germs. Very few people, as yet, grasp the relationship which exists between the day-by-day habits of life and personal health.

Health education was a logical development just as soon as the responsible authorities came to appreciate the limitations of compulsory public health measures and the necessary dependence of public health upon individual action in the control of many diseases as well as in raising the standards of personal health. Early public health laws were prompted largely by fear arising out of cholera epidemics. We have difficulty in realizing just how much the fear of disease determined national policies and individual actions. Epidemics were apparently so pitiless and inescapable that men, in their terror and ignorance, often did the very things which aggravated the calamity they would avoid. They fled, but disease and death kept pace with them, resulting in such social disorganization that famine, revolution and war were inevitable. A better understanding of the nature of disease has freed us from fears such as these, and as one disease after another has been brought under subjection attention has been given to the positive side of health work—the promotion of personal health.

Health is that condition which we enjoy when all parts of the body are functioning harmoniously. Personal health is not purchasable with money; it is based upon the habits of life of the individual. It is what we eat and how we eat it, the amount of rest, fresh air and exercise which we enjoy, our capacity to meet, in a self-satisfying manner, the day-by-day problems of living which decide what measure of physical and mental health shall be ours. The success of the tuberculosis campaign is the proof that by persistent and insistent educational efforts the living habits of the masses can be changed, evidence being found in the practice of open bedroom windows since the beginning of this century. The remarkable reduction in infant mortality can be credited to the better maternal care which has followed upon the instruction of mothers in infant hygiene.

It may be said that the health education of the public by public health workers is done on a very amateurish basis. Alongside commercial fields it suffers by comparison. The health teacher is handicapped by a training which makes him respect scientific truth, and so he is unable to offer a panacea, to chew, bite, drink,

or rub in. Nevertheless, despite all the attractive commercial short cuts to health, supported by the services of advertising experts who, apparently, are not hampered by any respect for the truth, a goodly part of the public have heeded the less flowery but truthful statements of the health educator presented in what may seem by comparison rather a less appealing manner.

Prolongation of life is desirable. Many years have been added to the average expectancy of life, due chiefly to the reduction in infant mortality and the practical elimination of a number of communicable diseases, which, formerly, took a heavy toll of human lives. It is within our power to add still more years by making fuller use of what knowledge we now possess, for at the present time well over one-third of the deaths which occur could be prevented or, to put it more correctly, postponed. But length of days is of less importance than the kind of days, for quality of life is infinitely more important than longevity. Health is desirable, not as an end in life but as a means to an end—that of increasing human happiness through a more nearly complete development of the efficiency and effectiveness of the individual. The individual is a functioning unit, and health represents a fitness of both the physical and the mental aspects of this unit. The two cannot be separated; both must be dealt with together, since man is not merely a wonderfully complicated *physical* machine.

It is because of our appreciation of this fact and a knowledge that mental disorders and the host of great and small defects in personality are responsible for the greater part of human unhappiness and social misfits that mental hygiene is slowly but surely coming to be accepted as an essential part of public health.

With the opening of such a wide field, it is evident that the need and opportunity for the voluntary and non-official groups to give leadership in public health is greater than ever. Leadership will consist very largely of health education which will arouse interest in the problem and then capitalize on the interest to present a plan for meeting the need, eventually leading to an expansion of public health services. At the same time health education will influence personal habits and attitudes, with the ultimate hope that the practice of good habits and sound insight into human behaviour will promote the physical and mental health of the individual.

Just because we have done so well with comparatively poor tools is no reason to be satisfied with what we have. We should, I feel, press on to improved services—continue what has been found useful and look for improved methods. Unfortunately, the term "reformer" has taken on a somewhat odious meaning because of certain unpleasant associations. The early public health workers, lay and professional, were reformers of the desirable type. To them we owe much, and history records their worth. There are today those who are their worthy successors and who are just as true reformers. It has been our privilege to know some of them—they are on your Public Health Committee, and they, acting on your behalf, have earned the designation of GIVERS OF LIFE. It is no more than the truth to say that the public health work which you have made possible has given life itself to many, and a better, because healthier, life to many more. I take advantage of this opportunity to pay my personal respectful tribute to the humanitarian spirit of the Canadian Life Insurance Officers Association, prompters and supporters of public health work to the benefit of all Canada.

Medical Economics

Dominion Income Tax Returns

In February, 1933, a memorandum was issued to the medical profession of Canada, with the approval of the Commissioner of Income Tax and the Canadian Medical Association, respecting Dominion Income Tax returns for members of the medical profession resident in Canada. As three years have elapsed since the memorandum was issued, and as so many requests for copies of it or information arising therefrom keep coming to us, it has been considered advisable to republish it, which we do hereunder.

DOMINION INCOME TAX RETURNS BY MEMBERS OF THE MEDICAL PROFESSION

As a matter of guidance to the medical profession and to bring about a greater uniformity in the data to be furnished to the Income Tax

Division of the Department of National Revenue in the annual Income Tax Returns to be filed, the following matters are set out:—

Income

1. There should be maintained by the Doctor an accurate record of income received, both as fees from his profession and by way of investment income. The record should be clear and capable of being readily checked against the return filed. It may be maintained on cards or in books kept for the purpose.

Expenses

2. Under the heading of expenses the following accounts should be maintained and records kept available for checking purposes in support of charges made:

(a) Medical, surgical and like supplies:

(b) Office help, nurse, maid and book-keeper; laundry and malpractice insurance premiums. (It is to be noted that the Income War Tax Act does not allow as a deduction a salary paid by a husband to a wife or vice versa. Such amount, if paid, is to be added back to the income);

(c) Telephone expenses;

(d) Assistants' fees;

The names and addresses of the assistants to whom fees are paid should be furnished. This information is to be given this year on or before the 31st March, but on or before the last day of February in each subsequent year on Income Tax Form known as Form T.4, obtainable from the Inspector of Income Tax. (Do not confuse with individual return of income, Form T.1, to be filed on or before 30th April in each year);

(e) Rentals paid;

The name and address of the owner (preferably) or agent of the rented premises should be furnished. (See (j)).

(f) Postage and stationery;

(g) Depreciation on medical equipment;

The following rates will be allowed, provided the total depreciation already charged off has not already extinguished the asset value:—

Instruments—Instruments costing \$50 or under may be taken as an expense and charged off in the year of purchase;

Instruments costing over \$50 are not to be charged off as an expense in the year of purchase but are to be capitalized and charged off rateably over the estimated life of the instrument at depreciation rates of 15 per cent to 25 per cent, as may be determined between the practitioner and the Division according to the character of the instrument, but whatever rate is determined upon will be consistently adhered to;

The residual value of instruments not heretofore fully depreciated will be depreciated along with instruments costing over \$50 purchased subsequently;

Office furniture and fixtures—10 per cent per annum;

Library—The residual value of library not heretofore fully depreciated will continue to be depreciated at 10 per cent per annum for the years 1932, 1933 and 1934 as well as charging off the actual cost of books purchased in those years. After 1934 only the cost of new books will be allowed as a charge.

(h) Depreciation on motor cars on cost;

Twenty per cent 1st year;

Twenty per cent 2nd year;

Twenty per cent 3rd year;

Twenty per cent 4th year;

Twenty per cent 5th year;

The allowance is restricted to the car used in professional practice and does not apply to cars for personal use.

(i) Automobile Expense; (one car).

This account will include cost of licence, oil, gasoline, grease, insurance, washing, garage charges and repairs;

(Alternative to (h) and (i)—In lieu of all the foregoing expenses, including depreciation, there may be allowed a charge of 10 cents a mile for mileage covered in the performance of professional duties.)

If chauffeur is employed so that in the result he is substantially used for business purposes (although incidentally used for personal or family use) the expense will be allowed.

(j) Proportional expenses of doctors practising from their residence—

(a) owned by the doctor;

(b) rented by the doctor.

(a) Where a doctor practises from a house which he owns and as well resides in, a proportionate allowance of house expenses will be given for the study, laboratory, office and waiting room space, on the basis that this space bears to the total space of the residence. The charges cover taxes, light, heat, insurance, repairs, depreciation and interest on mortgage (name and address of mortgagee to be stated);

(b) Rented premises—The rent only will be apportioned inasmuch as the owner of the premises takes care of all other expenses.

The above allowances will not exceed one-third of the total house expenses or rental unless it can be shown that a greater allowance should be made for professional purposes.

(k) Sundry expenses (not otherwise classified)—

The expenses charged to this account should be capable of analysis and supported by records.

Claims for donations paid to charitable organizations will be allowed up to 10 per cent of the net income upon submission of receipts to the Inspector of Income Tax. (This is provided for in the Act.)

The annual dues paid to governing bodies under which authority to practise is issued and membership association fees not exceeding \$100, to be recorded on the return, will be admitted as a charge.

The cost of attending post-graduate courses or medical conventions will not be allowed.

(l) Carrying charges;

The charges for interest paid on money borrowed against securities pledged as collateral security may only be charged against the income from investments and not against professional income.

(m) Business tax will be allowed as an expense but Dominion, Provincial or Municipal income tax will not be allowed.

Professional Men under Salary Contract

3. The salary of professional men will be taxed without any deduction therefrom except as hereunder provided, unless the individual is under contract which requires of him, in order to maintain his contractual position, to operate a motor car of his own, in which case if the principal does not pay the upkeep, running expenses and depreciation, the individual will be allowed to reduce the salary by such expenses as the use of the car in the earning of his income may cost, on the same basis as above provided for, i.e., expenses and depreciation or alternatively ten cents a mile for mileage covered in the performance of professional duties.

The annual dues paid to governing bodies under which authority to practise is issued, and membership association fees, not exceeding \$100, to be recorded on the return, will be admitted.

28th February, 1933.

Health Insurance as a Federal and Provincial Problem

The *Journal* has been informed as to certain points of interest to the Association and medical men generally as follows.

Any effective system of health insurance, involving, as it probably would, preventive measures that would inevitably affect minority rights, under sections 92 and 93 of the B. N. A. Act, could be enacted only by the Provinces and not by the Federal Parliament. Questions of sterilization, birth control, sex hygiene, the teaching of health in the schools, diversity of local economic and social conditions, hospital clearance and admissions, public and church hospital control, and similar matters necessitate that provincial jurisdiction remain supreme in the health field. At the same time the Federal Government should be encouraged to supplement provincial effort in matters of public health.

The above statement expresses the practically unanimous views of the representatives attending the Dominion-Provincial Conference.

Men and Books

THE CÆSAREAN SECTION

By JOHN HAROLD COUCH,

*Department of Surgery,
Toronto General Hospital,
Toronto*

AND HERBERT NEWELL COUCH,

*Assistant Professor of Greek, Brown University,
Providence, R.I.*

The derivation of the term "Cæsarean section" periodically comes up for discussion in both medical and classical journals. The most persistent belief, doubtless still shared by a distressingly large proportion of modern medical students, if not of modern surgeons, is that the operation was named after Julius Cæsar, who was brought into the world in this way, or at least that it refers to a law of Cæsar directing that the fetus be removed from a pregnant woman who died before giving birth to a child. In a book published just three years ago¹ (creditably to the profession, so far as this error

is concerned, it is not a medical book), it is stated clearly, and quite incorrectly, that a Cæsarean operation was performed "in the case of Julius Cæsar".

This whole tradition is inaccurate.² Not until long after the days of Julius Cæsar (102-44 B.C.) was the operation successfully performed on living women, and it is a matter of historical record that Julius Cæsar's mother, Julia, lived for many years after his birth. That fact effectively disposes of the myth that the operation takes its name from the method of Julius Cæsar's birth. The reference to a law of Cæsar is probably due to a confused recollection of a provision of the Justinian Law Code (*Dig.* 11, 8, 2), quoted by Marcellus, to the effect that a royal law forbade that a woman who had died in pregnancy should be buried before the fetus had been cut out (*Negat lex regia mulierem quæ prægnas mortua sit humari antequam partus ei excidatur*). Two interesting points of chronology arise here. The Justinian Law Code dates many years after the death of Julius Cæsar, but the royal law which is cited must

have been passed in the time of the Roman kings, that is, before 509 B.C. Therefore, it is clear that the operation was performed on dead women, if Marcellus is correct, for some four or five hundred years before the birth of Julius Caesar. According to the *Encyclopædia Britannica* (14th ed., Vol. 4, p. 526, s.v. *Cæsarean* section) the operation was first successfully performed on a living woman about 1500 A.D., although the mortality continued to be enormously high until comparatively recent times.

It is not without reason, however, that the name of Julius Caesar is so persistently attached to the operation, for it is altogether probable that some distant ancestor of his was born by means of a *Cæsarean* operation, performed on a dead mother, and the cognomen of *Cæsar*, which is derived from the verb *cado*, to cut, was attached to the newborn child for that reason. Another Roman family, bearing the name *Cæso*, may have derived its cognomen from the same cause. Such a method of assigning names would be entirely in harmony with the early Roman tradition. In fact, Pliny is the authority for

this assumption, for in his *Natural History* (VII, sec. 47; VII, ix, 7) he remarks that certain people were born by an incision of the mother (*enecta parente*), and that "the first of the *Cæsars*" was said to have been born in this manner (*a cæso-matris utero*). Just who the "first of the *Cæsars*" was cannot now be known with certainty. The earliest *Cæsar* who finds a definite place in Roman history was a Sextus Julius *Cæsar*, who was prætor in Sicily in 208 B.C., more than a hundred years before the famous dictator was born, but it is probable that there were others of the same name before him. The suggestion of Festus¹ that the name of *Cæsar* may be derived from the fact that a child was born with hair (*cæsaries*) on his head is simply an example of the uncritical ventures at derivation which are common in antiquity.

REFERENCES

1. The Oxford Companion to English Literature, compiled and annotated by Sir Paul Harvey, Oxford, at the Clarendon Press, 1932, page 127.
2. See Henry C. Montgomery, "Julius *Cæsar* and the *Sectio Cæsarea*", *Classical Weekly*, 1935, 28: 88; also Dr. H. H. Haggard, *Devils, Drugs, and Doctors*, New York, Harpers, 1929, p. 41.

Association Notes

PROCEEDINGS OF THE EXECUTIVE COMMITTEE

October 31, 1935

The Executive Committee of the Association met in Ottawa on October 31, 1935, at 9.30 a.m.

Re THE NARCOTIC ACT, THE FOOD AND DRUG ACT, BARBITURATES, ETC.

At the meeting of the Executive Committee held in Atlantic City, considerable discussion took place with regard to the sale of barbiturates and this matter was referred to the Committee on Pharmacy for careful study. The Committee on Pharmacy now reports that, in their opinion, a useful purpose would be served by a conference in Ottawa with the health authorities.

It was decided that the Chairman of the Committee on Pharmacy be authorized to confer with the Department of Health at Ottawa in regard to the various matters that had been referred to his committee.

ADVISORY COMMITTEE TO THE DEPARTMENT OF MILITIA AND DEFENCE

At the annual meeting in Atlantic City the Executive Committee approved of a list of representatives which would make up the Advisory Committee to the Minister of National Defence. The General Secretary presented a letter just received from the Department of National Defence, stating that, in reviewing the list of

nominations made by the Canadian Medical Association to the Advisory Committee, it was observed that representation had been made on a provincial basis rather than according to military districts. In order to have representation from all military districts it will be necessary for the Canadian Medical Association to nominate representatives for Military District No. 1, with headquarters at London, Ontario; Military District No. 3, with headquarters at Kingston; and Military District No. 5, with headquarters at Quebec, which have not been provided for in the former list. It was also pointed out that, owing to the death of Dr. P. Z. Rhéaume, of Montreal, it would be necessary to nominate someone to replace him. It was finally decided:

That in as much as the original nominations came from the Section of Military Medicine, this matter be referred to that Committee with authority to make the additional nominations required, also to nominate a successor to the late Dr. Rhéaume.

PLACES FOR FUTURE ANNUAL MEETINGS

Dr. Patch presented a progress report on this matter. He showed that in coming to a decision it was necessary to discover the attendance of the members at the various Annual Meetings during the past ten years, together with the income obtained from special grants and the rental of exhibition space; also the accessions of new members during the past five years registered at certain cities, with the per-

centage of permanent members resulting therefrom. The following points also had to be considered in deciding on any particular place as suitable for holding an Annual Meeting, viz., adequate hotel accommodation; adequate accommodation for General and Sectional Meetings in a hotel and in a convention hall or elsewhere; adequate accommodation for exhibits, and for social functions of various kinds. The Committee considered the following as possible locations for future Annual Meetings—Charlottetown, Halifax, Saint John, Quebec, Montreal, Ottawa, Toronto, Kingston, Hamilton, London, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Vancouver and Victoria.

In regard to the principles that should govern selection there are two schools of opinion. One says "We should meet only in the large places where ample accommodation, clinical material, hospital and hotel facilities, etc., are available". The other says "We should go all over Canada, stimulating and strengthening medical organization even at the sacrifice of quality and quantity in respect to the meeting". The consensus of the Committee was strongly in favour of the Association journeying at intervals to every section of the country, even if the attendance and financial returns were not so great as they would be if the meetings were held in the two central provinces of the Dominion. The difficulty lay in determining the proper rotation of visits to the various sections. Owing to the distance it is not wise to go too frequently to outlying points. For example, the Association will have travelled twice to British Columbia and once to Calgary from 1931 to 1936. This, it is felt, is an undue preponderance of visits to the West. The Committee divided the country into seven sections—the Maritimes, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia. In a rotation of ten years it was recommended by the Committee that annual meetings should be held in the areas mentioned as follows, Maritimes, once; Quebec, twice; Ontario, three times; Manitoba, once; Saskatchewan, once; Alberta, once; and British Columbia, once. (Toronto might have a meeting once in five years; other Ontario cities might be selected for the other times. The claims of Ottawa, as the capital of Canada for more frequent visits than this would imply, was especially urged by the Ottawa member of the Committee).

With regard to the selection for the proposed joint meeting of the British, American and Canadian Medical Associations, it would seem that only three cities could be considered as meeting the requirements. These are Winnipeg, Toronto and Montreal. As Winnipeg has in the last decade acted as host to the British Medical Association, it would appear that the decision must lie between Toronto and Montreal,

both of which cities have adequate accommodation. The hotel accommodation in these two cities is more or less equal. The decision is influenced largely by the possibility of securing accommodation for all possible convention requirements, apart from hotel accommodation, in one location. If the Canadian National Exhibition grounds and buildings could be made available, it is our opinion that Toronto is the logical choice for the joint meeting. This progress report was accepted. The following discussion thereupon arose.

DR. BAZIN.—In studying this matter, the Committee considered that its instructions limited its activity to a study of meeting places based upon the type of meeting we have had in the past. However, it appears to me that that point will have to be very definitely decided before any decision can be arrived at with regard to suitable places of meeting, i.e., whether we are to continue the same type of meeting we have had in the past and leave it more or less to the medical profession in the place of meeting as to whether the meeting will be in the nature of general sessions, with little opportunity for sectional meetings; or whether we are going to develop the annual meeting of the Canadian Medical Association as a meeting of the national body without respect to local opinion and prepare for the development of Sections so that every section will have an opportunity to meet every year. If the latter plan were adopted, we would have to restrict the places of meeting to a very few cities or towns where the necessary accommodation is available.

DR. PATCH (In answer to a question).—The proportion of membership is roughly as follows,—from the eastern boundary of Manitoba to the Pacific Ocean, 36 per cent, Central Canada 50 per cent, the Maritimes 14 per cent. Western membership is roughly one-third of the total membership.

THE GENERAL SECRETARY pointed out that federation may change the percentage of membership, and also have a very definite bearing on the complexion of annual meetings. We should decide whether the meetings will be held in some definite rotation and distributed throughout Canada, or whether a number of large, more or less central locations should be selected.

DR. KIRKLAND.—As Dr. Patch has pointed out, the Maritimes get one meeting in 10 years, but there would be at least two other meetings easily available to the Maritimes which they could attend.

DR. BAZIN.—In the past few years, the Canadian Medical Association, in the formation of sections, has absorbed certain associations of specialists who formerly held their own meetings by themselves every year. They were induced to come into the Canadian Medical Association as Sections with the promise that they could hold their meetings as Sections of the Canadian Medical Association at the time of our annual meetings. If we are going to hold these associations, they must be given an opportunity of holding the annual meetings of their Sections during our annual meetings. Therefore, we must have a definite ruling as to the type of meeting we are going to hold. If we do not hold sectional meetings the effect will be that we shall lose the adherents of our Sections and those specialists will gradually withdraw into their own associations.

DR. PRIMROSE.—I think we are obliged to make provision for meetings of the Sections which have come into the Canadian Medical Association, but is it necessary for all these to meet every year?

THE GENERAL SECRETARY.—We have always asked the Sections if they desire sectional meetings, and where they have expressed a desire for sectional meetings these have been held. However, the Sections have felt on a

number of occasions that they should not hold a sectional meeting because it would not be successful due to the few who would be able to attend.

DR. KIRKLAND.—If it were laid down as a definite ruling that each Section must hold sectional meetings, very often they would not be able to do so in the smaller places.

DR. PRIMROSE.—We should not set a definite rule, but let it depend upon the place of meeting. The Program Committee is now functioning along the lines of the opinion expressed by the Committee.

DR. FITZGERALD.—Is it timely to make any permanent ruling now? Presumably this Canadian Medical Association is evolutionary. What may have been suitable in the past may not serve most satisfactorily in the next ten years. Even if we decide something that would appear to be disadvantageous just now, the time will come when we must pass from infancy to adolescence, and from adolescence to maturity. It is of primary interest at the moment how we shall carry on the annual meeting of the Canadian Medical Association along with the annual meetings of the local societies. If the Canadian Medical Association is to resume post-graduate medical education in the near future, that also might be taken into account.

DR. MCEACHERN.—Why not decide now the matter of holding sectional meetings?

DR. BAZIN.—It is true that in the past there has been an opportunity for Sections to decide whether they would hold a sectional meeting. On the other hand, the majority of our Sections have never been properly organized and, therefore, the men who have made a decision with regard to holding a sectional meeting have been the men who reside at the place where the annual meeting is to be held. We should develop each Section as well as the general program. We should do something in the organization of Sections whereby, if there is a decision not to hold a sectional meeting, we will know that it comes from responsible people in that Section.

THE CHAIRMAN.—What must happen is this. A Section, say the Section of Medicine, will take steps to demonstrate how a sectional meeting can be properly organized and run. Some Section has to take the first step and show the others how it can be done. At the present time, the Executive Committee has appointed chairmen and secretaries of Sections. Any Section may, at any time, make their nominations for these offices, these to be approved by the Executive Committee. The recommendations contained in the report are merely tentative and not final and we are simply asked to accept these as a progress report. The discussion will be of value to the committee in their further deliberations.

DR. ROBERTSON.—In Victoria, we are already organized and one thing they want to know is whether we are to have Sections or not. We can put on either a general meeting or Sections. We have sufficient accommodation.

INVITATION TO THE A.M.A. AND B.M.A. TO MEET IN CANADA

THE CHAIRMAN.—Are we ready now, as an Executive Committee, to take any further steps looking to the possibility of the American Medical Association coming to us in Canada and, at the same time, attempting to bring the B.M.A. to Canada?

DR. PATCH.—Would it not be a good thing to sound out both Associations, especially the B.M.A., as we have already written to the A.M.A.?

DR. PRIMROSE.—I think within the next five years would be too soon for such a meeting. I would suggest that we leave the time open and see what suggestions would come from the B.M.A. and A.M.A.

It was finally decided:

That the General Secretary be authorized to sound out the B.M.A. and the A.M.A. with regard to the possibility of holding a joint meeting of the B.M.A., A.M.A. and C.M.A. in Toronto at a time to be subsequently determined; and that it be understood that the Canadian Medical Association will be responsible for all financial arrangements.

REPORT OF THE COMMITTEE ON CEREMONIAL

DR. J. S. MCEACHERN presented his report as Chairman of the Committee on Ceremonial. This was dealt with clause by clause, certain amendments being made, and was finally adopted. It may be said that the report set forth in detail a practical scheme for the conduct of the scientific and business sessions of the Association, the public functions, and the social features, having due regard to efficiency, celerity, and decorum. We hope to publish it in full later on.

THE SELECTION OF THE PRESIDENT

In the past usage has decreed that the President-Elect shall be chosen from the profession resident in the city in which the meeting is held. The constitution and by-laws does not contain any specific instructions. On a number of occasions, during informal discussion of this question, it has been pointed out that under the system which we have followed we are debarred from selecting for this office an eminently desirable man who lives in a centre where it is impossible to hold an annual meeting. In addition to this, it is quite possible under the present system to appoint to the Presidency a man who has never shown any active interest in medical organization or even distinguished himself in any field of medical practice. The Executive Committee decided as follows:

(a) The President-Elect may be chosen from any part of Canada without regard to the location of the next annual meeting.

(b) That no member will be considered as eligible unless he has been a member in good standing for the preceding ten years and has attended meetings of Council for one or more years some time during his period of membership.

HEALTH INSURANCE

In British Columbia.—DR. FLEMING presented the following report (somewhat abbreviated here) of his visit to British Columbia, where he went to assist in connection with the Health Insurance Bill which is being drafted in that Province.

"On November 23, 1934, the Director of Social Welfare for the Province of British Columbia, addressed a series of questions to the Health Insurance Committee of the College of Physicians and Surgeons, to which they replied on December 17, 1934:

(1) Q.—Does the Committee accept the statement of principles to be incorporated in health insurance system in Canada as laid down by the Committee on Economics of the Canadian Medical Association in their 1934 report? Are there any amendments to the C.M.A. report that the Committee would suggest?

A.—As regards your first question, our answer would be "yes". As regards any amendments, there might be some small items of local importance that might require modification, but on the whole, this report is thoroughly in accord with our opinion.

Visited Victoria on January 9 and was welcomed by Dr. Weir. I was invited by him to return to Victoria on January 17 and sit in with Dr. Cassidy, to whom had been delegated responsibility for drafting the legislation.

Meeting with the Health Insurance Committee on January 16, I placed before them a series of questions to which I wanted answers for my guidance. I noted in my diary "On most questions the Committee are not unanimous". I also noted "The real difficulty in speaking on behalf of the profession is that no one knows what the profession want. True, a questionnaire was sent out, but on some important points, the answers are about 50 per cent "yes" and 50 per cent "no". The Health Insurance Committee did instruct me:

"That, while as a profession we believe that the principle of payment for services should be followed whenever possible, we would not oppose a system of payment by capitation fee, provided that the fee per person, for general practitioner services, be approximately three dollars and fifty cents, with extra payments on a proportional basis for specialist services. It being understood that a complete service be provided for including hospitals and specialist services."

My conclusion was that I went to Victoria instructed to try to secure in the proposed legislation the "principles" as set out in the report of the Committee on Economics of the Canadian Medical Association, and to accept a sum of approximately \$3.50 for general practitioner services. I desire to indicate how this was attained by quoting first the "Principle" and then what is in the Draft Bill:

Principle I.—That, in the provinces where state health insurance is established, it be administered by the departments of public health (whether or not under a Commission), in order to co-ordinate the organized preventive and curative medical services.

Draft Bill (40—e).—The Commission shall have power, after obtaining the advice of the Medical Committee: To co-ordinate the medical services provided under this Act with such curative medical services as are provided by the Provincial Board of Health and (or) other public bodies. (45).—The Commission shall be composed of . . . the Provincial Health Officer.

Principle II.—That a Central Health Insurance Board and Local Insurance Boards be appointed, representative of all interested, to advise the responsible administrative authority.

Draft Bill (51—1).—The Lieutenant-Governor in Council shall appoint, for a term of three years, an Advisory Council . . . (2).—The Advisory Council shall represent the various interests concerned in the operation and administration of the Act, and it shall be

the duty of the Council to advise the Commission with respect to any phase of the operation and administration of the Act.

Principle III.—That the professional side of Health Insurance Medical service be the responsibility of the organized medical profession through the appointment, by the medical societies, of a Central Medical Services Committee and Local Medical Services Committees to consider and advise on all questions affecting the administration of the medical benefit.

Draft Bill (33).—The Commission, with the advice and assistance of the Professional Services Council and the medical services committees, shall establish and maintain the best possible standards of medical care for insured persons. (54).—The Lieutenant-Governor in Council shall appoint three persons nominated by the College of Physicians and Surgeons of British Columbia as a Medical Committee. The Medical Committee shall appoint its own Chairman and shall meet at the call of the Chairman or of the Commission to advise the Commission on all matters which have to do with the provision of services by medical practitioners under this Act. The Medical Committee shall advise the Commission and (or) the College of Physicians and Surgeons of British Columbia when it considers that disciplinary measures should be taken by either body against any medical practitioner . . .

Principle IV.—That local areas for health insurance administration correspond to urban municipalities and rural health unit areas.

Draft Bill (46—d).—(As a duty of the Commission) To appoint local advisory committees to advise on and assist in the administration of this Act in local districts, where and when it appears to the Commission that such local advisory committees are required.

Principle V.—That the whole province be served by adequate departments of public health, organized on the basis of individual health supervision by the health insurance general practitioner.

Draft Bill (40—c).—The Commission shall have power, after obtaining the advice of the Medical Committee: To designate the curative and preventive services to be provided by general practitioners (under this Act).

Principle VI.—That there be a State Health Insurance Fund, provincially controlled, and that "regional officers", to act as supervisors and referees, be appointed, paid and controlled by the provincial department of Public Health.

Draft Bill (66).—There is hereby created a Health Insurance Fund . . . (68—1).—Subject to . . . the Minister of Finance shall be custodian of all moneys and securities belonging to the Fund, and the Province shall be liable for the safe-keeping thereof.

Principle VII.—That medical care for indigents be provided under the Plan, the State to pay the premiums for the indigent, who then receive medical care under exactly the same conditions as the insured person.

Draft Bill (6—d).—(Under Insured Persons) Indigent persons resident in British Columbia for two consecutive years or more preceding registration as insured persons, and their dependents who have similar qualifications or who, being under the age of eighteen years, are resident in British Columbia. (17).—The Province of British Columbia shall make, from general revenues, contributions to the Fund sufficient to cover the cost of medical benefits provided by the Commission for indigent persons . . .

Principle VIII.—That the Plan be compulsory for persons, with dependents, having an income of less than \$2,500 per annum; and for persons, without dependents, having an income of \$1,200 and less per annum.

Draft Bill (6—a).—(Under Insured Persons) Employees who are resident in British Columbia and who are employed at a rate of wages not exceeding two hundred dollars per month or the equivalent thereof . . .

Principle IX.—That the dependents of insured persons be eligible for the medical benefit.

Draft Bill (6-a).—(Under Insured Persons) . . . and the dependents of these employees who are also resident in the Province. (6-b).— . . . and their dependents who are also resident in British Columbia.

Principle X.—That there be offered, on a voluntary basis, to those with incomes above the Health Insurance level, Hospital Care Insurance, and that this be administered as part of the State Health Insurance Plan.

Draft Bill (46-f).—(Under duties of Commission) To investigate voluntary hospital insurance as a means for persons not insured under this Act to meet the costs of hospitalization, and to organize and administer voluntary hospital insurance plans in cooperation with any hospitals that desire to participate . . .

Principle XI.—That the only benefit under the Plan be the medical benefit.

Draft Bill (22).—Cash benefits shall be provided . . . (25).—The proof of disability shall be a certificate signed by a medical officer of the Commission.

Principle XII.—That the medical benefit be organized as follows: (a) Every qualified licensed practitioner to be eligible to practise under the Plan; Provided in Draft Bill (29-1). (b) The insured person to have freedom of choice of general practitioner; Provided for in Draft Bill (30). (c) The medical service to be based upon making available to all a general practitioner service for health supervision and the treatment of disease; Provided for in Draft Bill (20-a). (d) Additional services to be secured normally through the general practitioner (1) Specialists and consultant medical service (only those so designated to be eligible to practise as specialist and consultant). (2) Visiting-nurse service in the home. (3) Hospital care. (4) Auxiliary services, usually in hospital. (5) Pharmaceutical service. (c) Dental service, arranged direct with dentist, or upon reference. All (d) and (e) provided for in Draft Bill (20 and 40-b).

Principle XIII.—That the Insurance Fund shall receive contributions from the insured, the employees of the insured, and the State.

Draft Bill (14-1).—Every employer . . . shall pay into the Fund . . . (14-2).—Every employee . . . shall pay into the Fund . . . (17).—The Province of British Columbia shall make . . . contributions to the Fund . . .

Principle XIV.—That the medical practitioners of each local area be remunerated according to the method of payment which they select.

Principle XV.—That the Central Medical Services Committee decide the relationship between specialist and general practitioner fees, and between medical and surgical fees.

Draft Bill (40-a).—The Commission shall have power, after obtaining the advice of the Medical Committee: To arrange for payment of medical practitioners, including specialists, by capitation fee, fee for services rendered, or otherwise. (40-b).—To designate specialists to practise under this Act . . . (40-c).— . . . to designate those specialist services to be provided only by specialists, and to designate specialist services which may be provided by non-specialists.

Principle XVI.—That contract-salary service be limited to areas with a population insufficient to maintain a general practitioner in the area without additional support from the insurance Fund. Covered in Draft Bill by (40-a) quoted above.

Principle XVII.—That no economic barrier be imposed between doctor and patient, but that the insured be required to pay a part of the cost of medicine.

Draft Bill (20-c).—(Under Medical Benefits) Drugs, medical, surgical, and optical supplies . . . Provided that insured persons other than indigent insured persons who receive such benefits may be required by regulation to pay not more than one-quarter of the cost of all such drugs and supplies.

It seems to me to be fair to state that the "Principles", as accepted by the Canadian Medical Association, have been included, with one exception, *i.e.*, the provision of Cash Benefits, but even here, we are met half way by having the responsibility for certification placed with the full-time medical staff of the Commission.

Certain additional or strengthening sections were included in the Draft Bill:

(20-i).—(Under Medical Benefits) Additional services to safeguard the health and safety of insured persons, . . . assistance towards the special training of persons providing medical benefits under this Act.

(33).—The Commission, with the advice and assistance of the Professional Services Council and the medical services committees, shall establish and maintain the best possible standards of medical care for insured persons.

(37).—The Commission shall . . . arrange for the fair and just remuneration of the persons or agencies providing medical services under this Act.

(50-1).—The Lieutenant-Governor in Council, with the approval of the College of Physicians and Surgeons of British Columbia, shall appoint a Director of Medical Services . . .

It should also be pointed out that section 39 of the Draft Bill provides "For the services of general medical practitioners not less than three dollars nor more than four dollars per annum per insured person entitled to receive these services".

This for the first two years, after which experience as provided for in Section 37, the Commission is to "arrange for the fair and just remuneration". The Draft Bill was intended "to serve as a basis for discussion by all interested parties", and, in March, 1935, it was published and circulated for that reason, and "comment and criticism" asked for.

I should like to make it clear that I am known as a believer in Health Insurance; I have publicly expressed my views on the subject; the Draft Bill was available to all in April or earlier; I had written my comments on the Draft Bill to Dr. Ainley. And yet, knowing all this, the Health Insurance Committee of the College extended an invitation to me, on behalf of the Government, in July, asking me to go out again.

The Health Insurance Committee of the College revised their report which they presented to the Hearings Committee on September 23rd, after I had left. In the letter accompanying their brief, they stated that they "are unanimously and unalterably opposed to the present enactment", the reason given being that the Draft Bill does not "indicate a reasonable assurance or indeed any likelihood of a high standard of scientific medical practice". Upon reviewing the re-drafted Report of the Health Insurance Committee of the College, I am of the opinion that the medical profession

would have secured most of what they want by way of amendment to the Draft Bill through friendly conference. On other points, a compromise could, I believe, have been reached.

The points I wish to make are these: (1) The British Columbia Government, through Dr. Weir, has followed along lines which we have approved in the past: (a) They called the profession into consultation in the drafting of their legislation. (b) They adopted the "Principles" of which the Canadian Medical Association have expressed approval, practically *in toto*. (c) They followed a most democratic procedure in putting up a Draft Bill for discussion. The response of the medical profession has, I fear, been such as to discharge any other government from following along these lines.

2. The Draft Bill includes practically all of the "Principles" for which the Canadian Medical Association stands, and to have these included in the legislation was, I feel, most desirable, but the provincial medical opinion is expressed as being "unalterably opposed" to the Draft Bill.

I do not consider that, as a member of the Hearings Committee, I should, at this time, comment on the Recommendations of the Health Insurance Committee of the College."

The General Secretary then presented an "Amended Report of Health Insurance Committee of the Council of the College of Physicians and Surgeons of British Columbia" as submitted to the Government Hearing Committee on September 24, 1935. In addition, the General Secretary presented a wire from Dr. W. E. Ainley, Chairman of the Health Insurance Committee of the College of Physicians and Surgeons of British Columbia.

The General Secretary further reported that, following receipt of the first wire, he had had a conference with Mr. Hugh Wolfenden with regard to the possibility of his going to British Columbia.

The Chairman then asked for discussion by the members of the Executive Committee.

DR. ROBERTSON.—As far as I can size up the situation, I believe the medical men are not satisfied with the drafted Bill. I think they would be fairly well satisfied if the motion passed at Atlantic City asking the Canadian Government to appoint a Royal Commission, were followed up. They are opposed to \$200 a month being the limit of a man's income as, in their opinion, he should be quite capable of looking after his own medical obligations with a salary of that amount.

THE CHAIRMAN.—If we were able to secure a Royal Commission, it would not be necessary to have an actuary go out to British Columbia at the present time. We might either help to send Mr. Wolfenden out or try to have a Royal Commission appointed.

DR. FLEMING.—I do not see that a promise from the Federal Government to appoint a Royal Commission would be of any advantage unless you get the British Columbia Government to await the action of the Royal Commission. They had a survey made some time ago and they feel that it should be quite adequate. The present

British Columbia Government was elected on the promise that they would set up a plan of health insurance and they are going ahead with it.

THE GENERAL SECRETARY.—Would it be possible to advance arguments to the British Columbia Government as to why they should wait? They had a Royal Commission in British Columbia but never had an actuary on that Commission. Our insurance friends insist that actuarial data with reference to Canada are not available.

DR. FLEMING.—An actuary cannot create morbidity rates for Canada. The Costs of Medical Care Committee was unable to arrive at any accurate estimates. When a Committee with unlimited funds was not able to get the desired information, how could we expect to do so with a couple of thousand dollars?

DR. FITZGERALD.—What are they going to make an actuarial survey of?

DR. MOORHEAD.—A year or so ago, we had Mr. Wolfenden and other prominent actuaries and tried to get an opinion from them as to an actuarial survey of the Province of Manitoba. Each one thought it too difficult a problem to draw up health insurance tables. It does not seem reasonable to me that actuaries could change their opinion so drastically within a year or so.

DR. FITZGERALD.—The point before us is, would it be well for us to spend \$2,000 in sending Mr. Wolfenden to British Columbia. I would like to know what the money would be spent for.

DR. FLEMING.—Could not the whole matter be cleared up if Mr. Wolfenden would meet the Sub-Executive Committee in Toronto and discuss with them what he thinks he could do in three weeks out there? If he can do something for them, I, personally, would favour his being sent.

DR. MEAKINS.—This summer, the General Secretary and I were in Vancouver. Apart from the Health Insurance Act, there was a great deal of discussion with regard to the question of federation. In considering this whole matter, I think the Government and the College of Physicians and Surgeons are at loggerheads over certain points. There is more or less suspicion on both sides, especially over financial matters. If we can give them some help, I feel that it would be wise to do so.

DR. MOORHEAD.—Have there been any statistics published within the last eighteen months that would lead Mr. Wolfenden to change his mind from what he expressed in Winnipeg?

THE GENERAL SECRETARY.—I think we may eliminate all thought of Mr. Wolfenden being able to make an actuarial survey within the next few weeks.

It was finally moved by DR. MEAKINS, seconded by DR. BAZIN:

That the Sub-Executive Committee be empowered to confer with Mr. Wolfenden and the Life Insurance Officers' Association to discuss the possibility of mutual cooperation and further that the Sub-Executive Committee be given power to take such action as it sees fit.

Carried.

THE CHAIRMAN.—Do you wish now to take further steps with regard to the appointment of a Royal Commission?

THE GENERAL SECRETARY.—I think the Executive Committee should, and could with advantage, reiterate the position we took at Atlantic City. Since that time, an election has been held and a new Government is in power. What they really need in British Columbia is time. Could we not communicate with the Prime Minister of Canada and take this matter up again.

It was moved and seconded:

That the General Secretary be instructed to take up with the Government the matter of appointing a Royal Commission to make a survey of Canada in respect to the health services of Canada.

Carried.

The General Secretary then presented the following wire received by him from Dr. Ainley of British Columbia:

"Please discuss with Executive matter of your coming out later. You will be needed."

In explanation of this, the General Secretary reported that the feeling was expressed in British Columbia last September that the General Secretary of the Canadian Medical Association should be present in British Columbia when the Bill comes up in the House, in order to support the point of view of the medical profession of Canada as a whole. This matter was referred to the Sub-Executive Committee with power to act.

The General Secretary reported that, in the Province of Alberta, the outgoing government appointed a commission which was to function when the Health Insurance Act was promulgated. The Act has not yet been promulgated, so no further action has been taken, and it is unlikely that the Act will be promulgated.

Federation et alia

In a personal letter received by the General Secretary, from Dr. Alfred Cox, former Medical Secretary of the British Medical Association, he makes the following comment *re* Federation which will be of interest to all of us.

"I am particularly interested to see the steps you are taking to bring about a greater unity of your Association; it is a tremendous job, but I am sure you are on the right lines."

With regard to the proposal that, at some future date, the B.M.A., A.M.A. and C.M.A. meet in Canada, are quoted hereunder some comments submitted to us by Dr. G. C. Anderson, Medical Secretary of the B.M.A., in reply to a letter from our General Secretary dealing with the matter:

"I think it would be a great thing for British medicine if it were possible to arrange a joint meeting of the C.M.A., B.M.A. and A.M.A. at some future date, and I can tell you that I think such a proposal would appeal to our present Chairman of Council."

Dr. Anderson goes on to say that the main difficulty he sees in the way is the fact that the B.M.A. is committed to meet in South Africa in 1941 and it would be unlikely that they could come to Canada in 1940. It would appear that we may be within striking distance of the tripartite meeting if the question of dates can be satisfactorily arranged. In replying to Dr. Anderson, the year 1938 (three years after the Australia meeting, and three years before the South African meeting), was suggested for consideration.

With regard to the proposed British Medical Association, American Medical Association and

Canadian Medical Association meeting, Dr. Cox says, "The idea you broach in your letter is a grand one".

Progress is being made in connection with the annual meeting in Victoria. It would now appear likely that the following sectional meetings will be held: Medicine, Surgery, Obstetrics and Gynaecology, Radiology, Medical History, Paediatrics, Ophthalmology, Ear, Nose and Throat. Two or three of the other sections have not yet come to a definite decision on the matter.

The Council of the College of Physicians and Surgeons of Alberta met recently and established a \$20.00 compulsory fee for the medical profession of that province for next year, which includes \$8.00 for the Federal Treasury (C.M.A.). This completes the financial side of the arrangements for the Alberta Division of our Association.

The circular letter reporting upon the year's work has been sent out to 9,158 doctors in Canada. A number of replies have been received all of which are very encouraging. A paragraph from a letter received from the Honourable Dr. J. A. Faulkner, Minister of Health for the Province of Ontario may be quoted:

"The Canadian Medical Association is certainly extending its activities and interests very broadly, and I hope the result will be the unification of the Medical Profession as an influence not only for the good of humanity but for the preservation of a body of men incorporate that means something to our country."

To 9,158 doctors there was sent a circular announcing the publication of the History of the Canadian Medical Association. To date, orders have been received for sixty-two copies of the History. We would like to see a more lively interest displayed in the sale of the book, than has been in evidence up to the present.

APHORISMS OF FULLER

Moderation is the silken string running through the pearl-chain of all virtues.

If thou wouldst be borne with, bear with others.

Let friendship creep gently to a height; if it rush to it, it may soon run itself out of breath.

Search others for their virtues and thyself for thy vices.

Thou oughtest to be nice even to superstition in keeping thy promises; and therefore thou shouldst be equally cautious in making them.

He lives long that lives well; and time misspent is not lived but lost.

He that smarts for speaking truth hath a plaster in his own conscience.

If thou art a master, be sometimes blind; if a servant, sometimes deaf.

Learn to hold thy tongue; five words cost Zacharias forty weeks' silence.

Hospital Service Department Notes

Interns from Unapproved Medical Schools

During the past year or so there has been an increase in the number of applications from United States' graduates for appointment to the intern staff of "approved" or "recommended" Canadian hospitals. This is in contradistinction to the observation that for a number of years a considerable proportion of the graduates of Canadian medical schools have been seeking internship in the hospitals of the United States. Undoubtedly, the approval of hospitals in Canada for internship by the Canadian Medical Association has been a major factor in drawing attention to the excellent internships available in Canada, but it has been noted that a number of the applicants from the United States in the last year or so have been graduates of unapproved or unrecognized medical schools in the United States, and the application of such individuals would seem to be associated with the action of the Council on Medical Education and Hospitals of the American Medical Association in withholding approval for internship from those hospitals accepting for internship graduates of unapproved or unrecognized medical schools. Some of these recent graduates have received ready employment in Canadian hospitals because of the lack of available graduates from our own Canadian schools. In both Canada and the United States the number of "approved" internships considerably exceeds the number of potential interns graduating each year, and, inasmuch as the number of students graduating each year is fairly constant, and as the number of "approved" internships is steadily increasing, this situation is one which is not likely to improve in the near future.

It has seemed advisable to the Committee on Approval that the standards of "approval" for internship in Canada should be kept at a high level; moreover, because of the desirability of being fair to Canadian interns who ultimately may desire to practise in the United States and of utilizing the services of United States' graduates who can bring stimulating viewpoints to the intern staffs of our hospitals, it is advisable that the present happy basis of relationship be retained, whereby internships in "approved" Canadian hospitals are accredited by the National Board of Medical Examiners. Acting upon this recommendation, the Executive Committee of the Canadian Medical Association, at its last session, authorized the

revision of the basis of approval to include the following clause:

"All interns from the United States must be graduates or final year students of approved (A.M.A.) medical schools."

It should be emphasized that this clause does not in any way suggest that appointments should be limited to graduates of Canadian schools. Despite immigration difficulties, during the past few years there has been a much appreciated and highly beneficial interchange of graduates for the intern years between the two countries. There is general acceptance in both countries of the grading of medical schools by the Council on Medical Education and Hospitals of the American Medical Association, and it is exceedingly gratifying to note that all of the medical schools in Canada have been approved by this Council. All of the hospitals on the "approved" and "recommended" lists have been furnished recently with lists of approved, unapproved and unrecognized medical schools on this continent.

It was agreed, also, that in subsequent revisions of the list of "approved" hospitals, the Committee would require that hospitals have autopsies upon at least 15 per cent of patients dying in those institutions. The previous requirement has been 10 per cent, but as most of the hospitals far exceed this minimum requirement, and as no hospital can be considered as giving the intern an adequate training which does not give him a higher percentage of necropsies than that formerly required, this minimum is being raised this next year.

Tuberculosis Control in British Columbia

During the past few months considerable progress has been made towards effecting tuberculosis control in this province, and the record of achievement for the past year, under the general auspices of the Hon. Geo. M. Weir and the Provincial Health Officer, Dr. H. E. Young, and the immediate direction of the energetic Provincial Medical Director of Tuberculosis Control, Dr. W. H. Hatfield, has been an enviable one indeed. Back in July a three-day conference of interested groups was held, at which every phase of an intensive tuberculosis campaign was discussed—diagnostic provisions, pre- and post-institutional care, social service and rehabilitation, district nursing, planned health campaigns, public education, prevention, research, post-graduate studies for physicians and nurses, etc.

A Central Council for Tuberculosis has been set up and also a Care Committee of representative personnel. A central administrative office at the Vancouver unit has been established and arrangements completed for a central admitting office. Dr. G. F. Kincaid has been appointed

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, 184 College Street, Toronto.

Travelling Officer in the interior and Dr. Frederick Kincaid on Vancouver Island. A clinic has been established at Victoria. This, plus a 42-bed unit taken over from the Provincial Royal Jubilee Hospitals, forms the Victoria unit, and the Vancouver General Hospital is assisting by handling the business administration for the Vancouver unit. Industrial surveys have been initiated. Public education has gone on with increased vigour; the exhibit held in Vancouver and in Victoria brought contact with 25,000 people in the former city alone; over 200,000 pamphlets have been distributed; doctors have been circularized; and health teaching has been augmented in the schools. Tuberculin testing in the schools has been started; preventorium work has been increased and also field work in the homes. Clinic work at the Vancouver unit has been augmented and a clinic started in the Chinese district. Occupational and vocational arrangements have been organized with gift funds and three Fellowships have been donated. Construction is now under way of a fine new \$175,000 addition to the tuberculosis unit in Vancouver. Altogether, this is an excellent record of achievement for such a short period.

Medical Societies

The Calgary Medical Society

At the regular monthly meeting of the Calgary Medical Society, held on December 10, 1935, Dr. F. C. Clarke gave an address on "Clinical observations on leprosy". As Dr. Clarke served several years on the staff of a leper hospital with two hundred beds, he was able to speak with authority on this disease. Dr. George R. Johnson followed with an address on "The Leper Saint", (Father Damien).

G. E. LEARMONTH

The Chinese Medical Association

The meeting of the Chinese Medical Association in Canton, held from November 1 to 9, 1935, was an occasion of unusual historic interest. It commemorated the centenary of the first hospital in China and the fiftieth anniversary of Dr. Sun Yat Sen's medical and revolutionary work. Nearly five hundred doctors from every province were present to pay homage to Drs. Parker, Pierson, Colledge and other pioneers of modern medicine in this land. Greetings poured in from medical organizations all round the world and included a suitable message from the Canadian Medical Association.

It was fitting that the meetings were held in the new buildings of this first hospital and in

the old and modernized city of Canton, for the old is giving place to the new. Almost incredible is the acceleration of progress during the past ten or so years in improved hospital service, medical education, public health education and programs and rural extension. For this a great deal of credit is due to the active interest of the government's Ministry of Health under the leadership of Dr. J. Heng Liu. Reports also showed an increasing cooperation between the government and mission hospitals throughout the country.

If the history of the past one hundred years could be condensed into the phrase "They come to us"—as they have in increasing numbers—indications point that the next period may be described by the phrase "We take it to them", for more and more the trend is to extend to the rural communities, public health measures and small clinics feeding the better equipped centres.

During one luncheon eighteen graduates of Canadian medical schools met and "reminisced."

The guests were lavishly entertained by the Medical Societies of Canton and Hongkong and by numerous departments of the Government. Canton is noted for the excellency and variety of its food, and the feasts to which we were invited included such delicacies as snakes, shark's fins, birds' nests, sea dogs, eels, rice sparrows, and one special dish for each table of ten was a small pig, tail, snout and all, served on a platter.

R. G. STRUTHERS,

Weiwei, Honan.

Edmonton Academy of Medicine

The November meeting of the Academy was held in the Medical Building of the University of Alberta on November 6th.

As a preliminary to the Scientific program an interesting paper on "Chest surgery as practised by Hippocrates" was given by Dr. N. E. Alexander. A Symposium on Empyema followed, fully covering all aspects of the subject.

Etiology, symptoms and diagnosis were taken up by Dr. G. E. Swallow who confined himself largely to the condition as found in infants and young children, indicating how serious it is in such cases and how much more difficult the early diagnosis.

The x-ray findings were given by Dr. P. H. Malcolmson illustrated by a series of x-ray plates shown on the screen.

Medical treatment was the subject of Dr. D. B. Leitch's paper, which he took up under four headings: (1) aspiration; (2) closed drainage; (3) closed drainage plus open drainage; (4) rib resection.

Surgical treatment, by Dr. W. H. Hustler, closed the symposium. Dealing first with acute empyema Dr. Hustler emphasized the following

measures: (1) drainage with careful avoidance of an open pneumothorax, during the period of acute pneumonia; (2) early sterilization and obliteration of the cavity; (3) maintenance of nutrition of the patient.

In dealing with chronic empyema the following were given as the necessary principles of good treatment: (1) to provide adequate drainage; (2) to remove foreign bodies; (3) to accomplish sterilization; (4) to adopt operative procedure if necessary; (5) to pay strict attention to general hygienic methods.

Following discussion of the papers given, the Nominating Committee submitted a list of nominations for the year 1936.

The annual banquet was held at the Macdonald Hotel December 4th. The speaker of the evening was Mr. P. M. Dunne, who entertained the 85 medical members present with the usual wit and humour of which a member of the legal profession is capable.

The election of officers for 1936 resulted as follows: *President*, Dr. Gordon Grey; *First Vice-president*, Dr. Irving Bell; *Second Vice-president*, Dr. Leslie Williamson; *Secretary*, Dr. John Scott; *Treasurer*, Dr. John Macgregor; *Committee*, Drs. Gordon Ellis, Kenneth Hamilton, William Hustler.

The Dr. Harold Brown golf trophy for the year was presented to Dr. M. M. Cantor.

The Calgary Medical Society was represented by Dr. Campbell, of Calgary, who brought greetings from the southern city. T. H. WHITELAW

The Montreal Dermatological Society

The fourteenth meeting of the Montreal Dermatological Society was held at the General Hospital on November 30, 1935, Prof. Albéric Marin being in the chair. The members present were Drs. Burnett, Burgess, Marin, McGovern, Ereaux, Sabettà, Boulais, Usher, Poirier, Mitchell, Cormia, Desforges, Garceau, Williamson and Grimes.

The clinical material, some fifty cases, was exhibited by members of the hospital staffs with discussion.

The minutes of the previous meeting were read and adopted, and the financial report was presented, showing a balance of \$7.29.

It was proposed by Dr. S. Usher, seconded by Dr. P. Burnett, that the Montreal Dermatological Society is in sympathy with the Canadian Medical Association regarding "Reports on Specialists", provided the details of the organization will be left in the hands of the British Dermatological Association (Canadian branch). Carried.

The meeting then adjourned, and the same evening a dinner was attended at the University Club.

PAUL POIRIER,
Secretary.

The Ontario Neuro-Psychiatric Association

The Fall Meeting of the Ontario Neuro-Psychiatric Association was held at the Ontario Hospital, Toronto, on November 29, 1935. The President, Dr. George C. Kidd, presided, and the Rev. John Bushell, of Toronto, gave the address of welcome. Papers were read by the following: Dr. C. A. Cleland, of the Ontario Hospital, Brockville, Dr. A. L. MacNabb, of the Department of Health, Toronto, and Dr. K. G. McKenzie, Neuro-Surgeon of the Toronto General Hospital. The Hon. Dr. J. A. Faulkner, Minister of Health, and Prof. R. B. Liddy, of the Department of Philosophy and Psychology of the University of Western Ontario, were the guest speakers at the dinner which followed.

A. MCCausland,
Secretary.

The Saint John Medical Society

Dr. R. A. H. Mackeen was the special speaker at the last monthly meeting of the Saint John Medical Society. Dr. Mackeen discussed both from a laboratory and clinical standpoint the various liver function tests. To the younger group of physicians this talk clarified the value of these various tests and the indications for their usefulness, while to some of the older members a good deal of the subject matter was new. Dr. Mackeen's presentation was the reverse of didactic and the evening proved both interesting and entertaining. A fair amount of routine business was conducted at the same meeting. The attendance was one of the best in this series so far.

The Winnipeg Medical Societies

The regular monthly meeting of the Winnipeg Medical Society was held on December 20th in the Medical College, with the president, Dr. Gordon Chown, in the chair. Clinical cases were presented and Dr. Daniel Nicholson, Associate Professor of Pathology, read a paper on "The constitutional therapy of cancer".

Dr. Nicholson reviewed the treatment of cancer during the last hundred years. He referred to an operation for cancer of the breast performed at the Middlesex Hospital in London in 1823, and pointed out that surgical measures for the extirpation of cancer have been thoroughly explored. In attempts at constitutional therapy the value of chemicals had been investigated chiefly up to about 1880. From 1880 to 1900 attention was devoted to bacteriological methods and the preparation of sera, while from 1900 on biological methods chiefly have been used. The technique of experiments on animals suffering from cancer is now so excellent that it is not necessary to experiment on

human beings. He pointed to the remarkable results that are being achieved by Murphy at the Rockefeller Institute, New York, using placental extract in the treatment of mouse carcinoma, and of Lumsden at the London Hospital, using sera.

R.B.M.

early in 1936. It will be known as the Nuffield Institute for Medical Research.

On October 23rd Professor John Mellanby, M.D., was appointed to the Waynflete Chair of Physiology, to hold office from January 1, 1936.

University of Reading

At a congregation held on December 2nd, on the occasion of the installation of Sir Austen Chamberlain as Chancellor of the University, the honorary degree of D.Sc. was conferred upon Sir Frederick Gowland Hopkins, P.R.S., F.R.C.P.

University Notes

McGill University

During 1935 gifts have been made to the University aggregating more than \$40,000. Some of these are the following.

To the Faculty of Medicine — From the Rockefeller Foundation \$24,000, to be given in three yearly instalments of \$8,000 each, to continue work that has been done in the Medical Faculty in conjunction with the Department of Physics (investigating lead and other metals in the tissues).

Anonymously, \$5,000 for the Department of Biochemistry.

From Mrs. Maurice Scott \$500 for the Department of Biochemistry.

From Prof. H. E. Reilley, a cyclopropane apparatus for the Department of Pharmacology.

The Canadian Medical Institute gave \$25 as a prize for the best essay, in the Final Year Class, on Periodic Health Examinations.

To the Medical Library came from Dr. Casey Wood 371 articles, most of them very rare, purchased by him from Dr. Myerhof's Collection of Far Eastern Ophthalmic Literature.

The McGill Medical Undergraduates' Society gave \$100.

The McGill Dental Undergraduates' Society gave \$25 for the purchase of books for the Faculty of Dentistry.

Anonymously \$100 was donated to the Medical Library Special Fund.

All will regret to learn that Drs. E. W. Archibald and W. G. M. Byers, Chiefs of the Departments of Surgery and Ophthalmology, respectively, of the Royal Victoria Hospital, Montreal, retired from these services at the beginning of the year.

University of Oxford

At a congregation held on October 22nd it was resolved to give Lord Nuffield's name to the new institute for medical research, for which he has presented the site of the Radcliffe Observatory and a sum of £16,000. Sir Farquhar Buzzard, Regius Professor of Medicine, announced that the interior of the famous building was now well on its way to being re-adapted for its work, which will be started

Special Correspondence

The London Letter

(From our own correspondent)

Debates seem to be a popular form of dealing with current medical problems at the present time. Thus the Hunterian Society recently organized one with the motion "That Birth Control is Unnecessary in Modern Life", in which the Bishop of St. Albans supporting this was opposed by a well-known eugenicist. The speakers rather got away from the word "unnecessary" which, of course, was the keynote of the motion as phrased and there was the usual attack and defence of the religious standpoint, with the mention of the "safe period" as the solution of the problem. Another debate was promoted by the Fellowship of Medicine with the provocative motion "That the Present Rate of Maternal Mortality is a Discredit to Modern Obstetrics". The general impression to be gained from the reports of the meeting was that the general practitioner was put in the dock by the public health authorities and that his defence lay along the lines that his training was not all it might have been, and that he was often called in too late or by people who implored him to do "something". The early discovery and treatment of abnormalities, according to one speaker, would become possible under a national maternity service. This was mentioned in the program put forward by the new government, and the British Medical Association Council has just issued its comments on the subject, suggesting that the best method of providing an efficient maternity service would be an extended system of National Health Insurance with the services of a doctor (at some time or other) and a midwife for every case. Sterilized obstetric dressings for every patient is another point stressed in the British Medical Association report. This has, of course, reference to the alarming way in which puerperal sepsis still constitutes a fundamental problem as part of the cause of a high maternal mortality

rate. A recent report issued by the Medical Research Council suggests that the source of trouble in most instances of puerperal infection is the carrier of hæmolytic streptococci in the upper respiratory passages. In two-thirds of a series of patients investigated an extra-genital source of infection was found and among the "contacts" must be included the doctor, the midwife, the handy woman, the husband, other children and other members of the household. The practical application of this knowledge in elementary hygienic precautions in the home should not be a difficult matter.

One important difference between the voluntary and the municipal hospital in this country is that the former pays "rates" to the local borough funds, while the latter not only pays none but is supported out of the borough's coffers. The position varies in certain areas, but it is freely admitted that some hospitals are assessed just as if they were purely commercial concerns. Indeed they are worse off than factories, for de-rating has been allowed in many instances where this has helped in reducing unemployment. Relief has been granted to certain hospitals for certain portions of the rates (as for example the education rate), and in this respect Scottish corporations have been more enlightened than English local authorities. But many hospitals can fairly claim, in the words of *The Lancet*, to be depressed industries and relief, rather than the reverse, ought to be the rule.

Mention of the voluntary hospitals and their financial troubles brings to mind two other aspects of the problem. King Edward's Hospital Fund for London, which does so much to help the voluntary system, has made a special Silver Jubilee distribution of £120,000, part of which came from the sale of seats to view the processions. This is mostly allocated for capital expenditure on schemes for improvement or extension. The King's Fund distributes annually about £300,000 and recently the "Anti-Vivisection Hospital" has appealed successfully in the courts to change its name and objects so as to become eligible for a share in this distribution. Thus there comes to an end a strange enterprise and the senior surgeon, who presumably had at one time subscribed to the pledge that no member of the staff would ever perform any vivisection nor use remedies which could be obtained only as the product of experiments on living animals, swore an affidavit to the effect that the progress of science and advance in medical knowledge had made it impossible to run a hospital on anti-vivisection principles. The Battersea General Hospital, under its new title, enters upon a new period of unhampered enterprise.

The nutrition of the school-child has been mentioned before in these letters, and the report of the Chief Medical Officer of the Board of Education for 1934 shows that on the whole there is little deterioration when the problem is

viewed nationally. There is, however, a slight increase of children thought to be badly nourished on routine medical examination. This makes it all the more important that a muddle regarding school meals should be cleared up. A recent circular issued by the Board of Education is characterized by the *British Medical Journal* as suggesting a "lack of foresight" towards the medical issues involved. The previous circular has come in for some hard criticism, and it rather looks as if someone will have to think again—on the problem of how to prevent malnutrition by providing meals before the child is obviously ill enough to be called out for a special medical examination.

ALAN MONCRIEFF.

121 Harley St.,
London, W.1.

The Edinburgh Letter

(From our own correspondent)

An interesting book entitled "Leaves from the Life of a Country Doctor", has just been published. It relates the experiences of the late Dr. Clement Bryce Gunn, of Peebles. These have been edited by Mr. Rutherford Crockett, and there is a Foreword by Lord Tweedsmuir, Governor General of Canada.

Dr. Gunn was an example of the best type of country doctor. He commenced practice in the days when there were no motor cars. The doctor was dependent upon horses for transport, and calls to patients twenty miles distant involved hardships of which the modern medical man knows little or nothing. In his novel "The Surgeon's Daughter", Sir Walter Scott speaks of village doctors "from whom Scotland reaps more benefit and to whom she is perhaps more ungrateful than to any other class of men, excepting her schoolmasters".

Dr. Gunn was born in 1860, and five months after his birth his mother was left a widow with six children to bring up. In those days there was no help such as is now provided by the Carnegie Trustees nor the many bursaries which are now available. The history of the Gunn family is a fine example of what pluck and independence can achieve. In his student days Gunn had as classmates Conan Doyle, Barrie, and S. R. Crockett, while Joseph Bell, the original of Sherlock Holmes, was one of his teachers.

The book contains many anecdotes. One relates how a doctor had ordered that six leeches should be applied to a man's stomach after bathing the skin in sweet milk. On his return the wife of the patient in response to the inquiry as to how her husband was, said, "Dinna be angry, doctor, we poured the milk into his stomach, but he couldna swallow a' the leeches raw, so we just fried the other three". The story is also told of the old Highland minister who had endeavoured without success, to get a subscription from the late Prof. Grainger Stewart

for a charitable purpose in connection with his church. His next call was on a fellow professor to whom the minister told the tale. When asked what he said to the Professor of Medicine, when he refused to subscribe, the reply was "I told him he was just a hell-deserving sinner like myself". "You told him that. Good! Here are ten pounds for you."

An appeal for a further extension of facilities for physical education in the Scottish Universities has been made by Dr. Chalmers Watson, runner up to Lord Allenby in the recent rectorial election, in a recent article in *The Student*, the Edinburgh University magazine. He states that the advantages and, indeed, the necessity for a reasonable measure of physical culture is not open to question. The healthy interaction of mind and body is of supreme importance. The opinion may be hazarded that when that healthy interaction is established the mental efficiency of the student would be increased from 10 to 20 per cent, and his all-round efficiency proportionally increased. He suggests that the Student's Representative Council should consider the matter, as there is a growing feeling that the national education system was defective and was not producing "the goods" demanded by modern conditions.

This matter is also dealt with by Dr. Arthur MacNalty in his first annual report as Chief Medical Officer of the Board of Education, who is of opinion that a great amount of good work has already been accomplished in this connection. He says "In this land of fog and mist and, let us add, this land of bright spring days and radiant summers, the old Greek spirit has been recaptured and the harmony between training of the mind and training of the body has been re-established. It is seen in the improved level of general education and knowledge, in the playing fields and sports grounds of the schools of to-day, in the walking parties and cyclists that throng the roads and lanes of the countryside, in the great increase in swimming baths—both open-air and closed—of recent years, in the love of amateur sport and in the increasing interest taken in the work of educational and health authorities." Commenting on the fact that if physical exercise is carried too far two body systems may be overworked instead of one. Dr. MacNalty states, "At older ages, anxious nervous men frequently abuse muscular exercise in employing it as a means of resting the brain. By ways such as these an attempt is made to correct one mistake by committing another."

Seven members of the Departmental Committee on Scottish Health Services have been appointed to prepare the complete draft report for submission to the Committee. These members have a very heavy task to perform, and are at present meeting on several days of the week in order to accomplish the work. In view of the comprehensive nature of the remit it cannot be expected that the report of the Com-

mittee will be unanimous in all respects. Reservations will doubtless be made regarding certain of the recommendations. There is every likelihood however that, so far as the main findings of the Committee are concerned, there will be complete unanimity. It is hoped that the report will be submitted to the Secretary of State for Scotland during the month of January.

R. W. CRAIG.

7 Drumsheugh Gardens,
Edinburgh.

Letters, Notes and Queries

Federation

Dr. T. C. Routley,

Secretary O.M.A. and C.M.A.

I have read with very much interest the information you sent me, looking towards the making of the Provincial Associations Divisions of the Canadian Medical Association. I have noted with interest that the Associations of Manitoba, Saskatchewan, Alberta and British Columbia, in the West, and the Associations of Nova Scotia, New Brunswick and Prince Edward Island, in the East, have approved of the plan in principle. I have also given some study to the Constitution and By-Laws that are proposed for the Government of the Canadian Medical Association and the various Provincial Divisions.

In Great Britain a system similar to the one outlined for this country has been in operation for many years, and has given very general satisfaction. There is no reason why such a scheme would not equally do so here. In Britain there still exist local societies in the cities, and several in some of the larger cities. In like manner the Academies of Medicine in Hamilton and Toronto, the Medical Society in Montreal, and in Winnipeg, and the local Societies elsewhere, could carry on just as they are doing now. By the change all medical practitioners belonging to the Association would, as a matter of fact, belong to the Canadian Medical Association and the Division in his own Province. This should appeal to most members of the profession.

There has been for some time a close co-operation between the Canadian Medical Association and the Provincial Association. The proposed scheme would only have the effect of making this cooperation closer and more effective. Such a change would lend prestige, status

Answers to questions appearing in this column should be sent to the Editor, 3640 University Street, Montreal.

and strength to the voice and opinion of Canadian Medicine in all its efforts to raise the standards of the profession, educationally, ethically and legally. On all these lines, no doubt, many problems will arise in the solution of which union will prove strength.

I am,

Yours faithfully,
JOHN FERGUSON.

Toronto, December 17, 1935.

Dr. John Ferguson is the only living Charter Member of the Ontario Medical Association, now in its fifty-sixth year, and, coming from one of the founders of that Association, a past-president, and one of the most revered and respected of its members, past or present, his letter is valuable both for its content and for its perspective. Dr. Ferguson, who has long since passed the allotted span, is young and vigorous in intellect and interest, and we welcome his opinions here. [Ed.]

Shakespeare, A Medical Prophet

To the Editor:

Whether Shakespeare's genius lay chiefly in his acute perceptions and sympathy with all the phenomena of human behaviour or in his ability to portray them in matchless and undying language is debatable. In combining these powers he was supreme. That he should thus appear all things to all men is comprehensible. It has become commonplace to find him presented in every sort of guise by enthusiasts whose judgment has been swayed by their partialities. From his writings authority has been gleaned to make him out variously a classical scholar, a lawyer, a professional soldier, a physician, a musician, a Freemason, a champion of the Protestant cause and a secret Catholic. Although he put chimney-pots in Cæsar's Rome and gave Bohemia a sea-coast, a recent writer confounds his geographer-critics by discovering that Bohemia once did possess a sea-coast, and we may expect shortly to have Shakespeare pronounced an authoritative cartographer.

Dr. Edgar, writing in a recent number of the *Journal* (1935, 33: 319), indicates the proper approach to such claims, and especially those by medical commentators, when he correctly points out that Shakespeare had but the knowledge which might be expected in any intelligently observant man of his time, and that he very probably had special reasons to be familiar with a number of medical topics of his day. Nothing more than this appears in the numerous quotations adduced by those who have claimed for him a place in the medical faculty.

Thus we cannot feel that Shakespeare reflects with an expert's accuracy the current quotations in the market for meninges when he makes rough-tongued Thersites say of Ajax

I will buy nine sparrows for a penny, and his piamater is not worth the ninth part of a sparrow.
(*Troilus and Cressida*, II, i.)

And later when the same fluent fellow enumerates the more striking features of this preposterous syndromic curse

—the rotten diseases of the south, the guts-griping, ruptures, catarrhs, loads o' gravel i' the back, lethargies, cold palsies, raw eyes, dirt-rotten livers, wheezing lungs, bladders full of imposthume, sciaticas, limekilns i' the palm, incurable bone-ache, and the rivelled fee-simple of the tetter—

(*Troilus and Cressida*, V, i.)

Shakespeare falls from his medical pedestal. Only a testimonial writer in a patent-medicine almanac could have imagined such a concatenation of symptoms. But the multi-coloured fraternity of drugless healers feel that the dramatist expressed his own sympathy with them when he made Macbeth say

Throw physic to the dogs, I'll none of it.
(*Macbeth*, V, iii.)

Let us once admit however that Shakespeare had prophetic knowledge of medical practice in the twentieth century, and how clearly we can see his recognition of the place of the specialist, and his particular problems. Observe Hamlet's strictures upon cosmetics

I have heard of your paintings too, well enough; God hath given you one face, and you make yourselves another:

(*Hamlet*, III, i.)

Lady Macbeth's vain search for an efficient detergent,

What, will these hands ne'er be clean?

and her discovery that

all the perfumes of Arabia will not sweeten this little hand,

(*Macbeth*, V, i.)

and we can see how he realized what the modern dermatologist is up against every day. Listen also to the tone of authority in the specialist's pronouncement, when Aaron declares

No, madam, these are no venereal signs.
(*Titus Andronicus*, II, iii.)

Again, how can we doubt that Shakespeare foresaw the place of the gynaecologist in the scheme of things, when Biron in his meditation reflects that

A woman . . . is like a German clock,
Still a-repairing, ever out of frame.
(*Love's Labour Lost*, III, i.)

His anticipation of the importance to the surgeon of a future age of an organ hardly known to exist in his time is nothing less than the very magic of prophetic genius, but he leaves us in no doubt when he gives Biondello these lines:

My master hath appointed me to go to St. Luke's, to bid the priest be ready to come against you come with your appendix.

(*Taming of the Shrew*, V, ii.)

Whatever other interpretation pedants may derive from the context, it must be clear to us that Biondello was the junior assistant to an abdominal surgeon, who, careful man, was providing for any unfortunate eventualities at the hospital.

But, after all, Shakespeare was a man like us, and we believe on good contemporary authority that he was a man of convivial habits in his London days. So while deprecating the obvious anachronism he perpetrated in permitting the Hellenist rulers of Egypt to enjoy the delights of usquebaugh, we may feel some kinship with him in recognizing his generous estimate of the stomach's capacity when he permits Searus to assert—after a hot fight it is true—

I have yet

Room for six scotches more.

(*Antony and Cleopatra*, IV, vii.)

D. E. H. CLEVELAND.

Vancouver,

September 20, 1935.

The Administration of Iron

To the Editor:

In the paper by Lucas and Henderson (*Canad. M. Ass. J.*, 1936, 34: 53), "On the administration of iron", there are one or two inconsistencies which I feel should not go uncorrected.

The authors have correctly emphasized the importance of using massive doses of iron and also that iron is absorbed only in the ferrous state. In discussing the various preparations used, it is stated "Ferrous Chloride as contained in Syrupus Ferri Chloridi C.F. (though the dose in the C.F. may be doubled) appears to surpass all other preparations of iron. One to three grains of iron or 2.5 to 7.5 grains of Ferrous Chloride in this form appear to equal some—60-90 grains of Iron and Ammonium Citrate, and about the same amount of Bland's Pill". I should like to point out: (1) that a dose of 1 to 3 grains of iron per day does not coincide with the insistence earlier in the communication for massive doses of iron; (2) the 'therapeutic equivalence' of one to three grains of iron as Ferrous Chloride to 60 to 90 grains of Bland does not appear to coincide with the chemical reaction and simple calculation involved. If Bland's Mass, which contains 22.5 per cent of Ferrous Carbonate is mixed with N/10 Hydrochloric Acid and warmed to body temperature, the ferrous carbonate is rapidly and completely converted to ferrous chloride, with the evolution of carbon dioxide. This

reaction undoubtedly takes place in the stomach, so that in effect the ferrous chloride formed is as available as if preformed ferrous chloride had been taken. By simple calculation it can be shown that 1 to 3 grains of iron as Ferrous Chloride is equivalent to 9.2 to 27.6 grains of Bland which differs considerably from the 60 to 90 grains as stated by the authors.

The importance of recognizing this is that if Syrupus Ferri Chloridi is to be used for the treatment of anæmia considerably larger doses than suggested in the paper would be necessary in order to make available the "massive" doses of iron. This syrup at the same time is not the pleasantest of preparations to take, and by comparison Bland's Mass is, I feel, the much more desirable of the two preparations.

E. LOZINSKI

Montreal, January 14, 1936.

Vitalex

To the Editor:

A local drug store chain has been "ballyhooing" the above-mentioned proprietary over the radio. They have employed an individual who calls himself Professor Gladstone to sell it at \$1.00 a bottle or six for \$5.00. He has a great line of chatter, fortune telling, etc., and incidentally, he occasionally recommends a certain faith healer in town by name. Probably you could tell us something about the composition and relative cost of the stuff.

Your sincerely,

J. H. DUNCAN

176 East Street,
Sault Ste. Marie, Ont.,
November 28, 1935.

Answer.—The Bureau of Investigation of the American Medical Association to whom the above was referred replied, in part, as follows: "Vitalex was being boosted a few years ago by one of the drug store chains in Chicago, but the thing apparently died out, at least locally, as we have heard very little about it for some time. We ourselves never examined the stuff, but the Bureau of Chemistry at Washington did analyze it . . . "Refer below for Notice of Judgment. As can be seen, this gives a brief abstract of the American government's prosecution of the Vitalex concern for violating the Pure Food and Drugs Act on several counts.

"Notice of judgment, New Jersey, 18203; October, 1931) Vitalex.—Chemicals and Drugs Inc., Baltimore. Composition: Caffeine, salicylic and benzoic acids, licorice, wild cherry, a laxative drug, strychnine, valeric acid, volatile oils, alcohol and water. Adulterated and misbranded. Falsely represented as containing vitamin D."

EDITOR

Topics of Current Interest

Clinical Endocrinology

In February the *Journal of the American Medical Association* began publication of a series of articles on Glandular Physiology and Therapy, prepared under the auspices of the Council on Pharmacy and Chemistry. This series, which comprises thirty-two sections covering practically every known phase of endocrinology, is now completed and will soon be issued in book form. Preparation of the series was undertaken primarily to provide a convenient and authoritative source of information for physicians, so that glandular therapy might be placed on a more rational plane. Investigators and teachers, however, will find it a valuable reference work. In addition, many of the reviews will be of assistance to the Council on Pharmacy and Chemistry in evaluating the various endocrine preparations now so extravagantly extolled by pharmaceutical manufacturers. Almost without exception, the conclusions of the authorities in their respective fields have upheld the action of the Council in refusing to accept for New and Non-official Remedies, without more evidence, many of the widely used glandular products.

Commercial propaganda, together with an insufficient skepticism on the part of physicians, has led to widespread misapplication of present knowledge in endocrinology. Oestrogenic and gonadotropic preparations are extensively employed in clinical syndromes in which they can hardly be expected to produce therapeutic benefit and in which they may even do harm. Commercial extracts of the adrenal cortex, recently shown to be practically devoid of the essential life-sustaining principle of the gland, are being used in the treatment not only of Addison's disease but even of such conditions as glaucoma. A variety of glandular products are administered by mouth, by which route many of them cannot be expected to prove effective even if they contain active material. Most of them do not! Pluri-glandular products are widely employed with little rational basis and less therapeutic effect.

Misapprehensions in endocrinology are also extended to surgery and to radiology. The practice of partial adrenalectomy or adrenal denervation for the relief of hypertension, diabetes, hyperthyroidism, peptic ulcer and other conditions is by no means established as of value. Operation on this gland is an exceedingly hazardous procedure, and the mortality rates are most discouraging. The adrenal gland is essential to life; it lies in a nest of highly sensitive nerve structures. Even if therapeutic benefit might be expected to accrue from such surgical manipulations the hazard to the life

and health of the individual may prove greater than that of the disease it is proposed to alleviate. Furthermore, Addison's disease may be added to the original condition.

Radiologists have been irradiating the pituitary in the treatment of certain menstrual disorders, hypertension and other conditions; the adrenals have also been exposed to roentgen rays in the hope of lowering high blood pressure or decreasing the insulin requirement in diabetes. These procedures, too, may have effects more serious than the original disorder.

The cooperative efforts of the twenty-six authors who have prepared the series on Glandular Physiology and Therapy, in which all these questions are considered, should fill an important place in the armamentarium of both physician and investigator. Requests have been received from many foreign countries for the rights to translate this series of articles into other languages. It is hoped that American physicians will avail themselves of this book and use it as a guide to sound endocrine therapy.—*J. Am. M. Ass.*, 1935, 105: 722.

Reform in Radio Advertising

At last the United States seem to be *en route* to reform in the type of advertising promoted over the radio. For some time the National Broadcasting Company has been quietly and consistently elevating the standards of material permitted to be broadcast over its network. The Columbia Broadcasting System has just made available an announcement by its president setting forth the new policies which will guide that network for the future.

Briefly, the new policies involve purification in the type of material broadcast to children, both as entertainment and as advertising. The Columbia Broadcasting System will not permit broadcasting for any product that describes graphically or repellently any internal functions, symptomatic results of internal disturbances, or matters that are generally not considered acceptable in social groups. This policy will specifically exclude from advertising not only all laxatives as such but the advertising of any laxative properties in any other product. It will further exclude the discussion of depilatories, deodorants, and other broadcasting which by its nature represents questions of good taste in connection with radio listening. Among other basic advertising policies will be the barring of testimonials that cannot be authenticated, and an attempt to bar claims that are false and unwarranted.

This new trend in the control of radio advertising must logically be associated with several evidences of endeavours by the government to control in various ways the evil of exaggerated and fraudulent advertising, which

has been gradually pyramided during the last thirty years into a structure that would inevitably sooner or later have toppled of its own weight. Among the handwritings on the wall are the passage by the Senate of the new Cope-land bill, which, though utterly inadequate, is nevertheless a beginning in the direction of legislation to control advertising, and also hearings recently held by the Federal Communications Commission on the subject of education by radio.

The House of Delegates of the American Medical Association at its sessions in 1933 and again in 1934 adopted resolutions opposing misleading radio broadcasting. In pursuance of this action of the House of Delegates, two representatives of the headquarters office of the American Medical Association appeared before the hearings conducted by the Federal Communications Commission in Washington on May 15. Dr. W. W. Bauer, director of the Bureau of Health and Public Instruction, emphasized the interest of the American Medical Association in proper education in the field of health and indicated the manner in which radio education is involved in its program. He also recounted some of the experiences of the medical profession in attempting to secure adequate broadcasting in the field of health not only over the national chains, but also over various local outlets. Dr. Arthur J. Cramp, director of the Bureau of Investigation, presented a statement with respect to "patent medicine" advertising on the radio, supplementing his presentation with typewritten copies of phonographic records that had been made of five "patent medicine" announcements.

Great nations move slowly in their efforts for reform, but eventually an annoyed and deceived but too tolerant public rises in its wrath and reacts against those who abuse its tolerance.—Reprinted from the *American Medical Association Bulletin* of May, 1935.

Trust not to the Omnipotency of Gold, and say not unto it Thou art my Confidence. Kiss not thy hand to that Terrestrial Sun, nor bore thy ear unto its servitude. A slave unto Mammon makes no servant unto God. Covetousness cracks the sinews of Faith; nummes the apprehension of any thing above sense; and only affected with the certainty of things present, makes a peradventure of things to come; lives but unto one World, nor hopes but fears another; makes their own death sweet unto others, bitter unto themselves; brings formal sadness, scenical mourning, and no wet eyes at the grave.—Sir Thomas Browne.

Medico-Legal

XIX.

Mutual Life Insurance Company of New York,
Plaintiff-Appellant.

v.

Dame Henriette Jeannotte-Lamarche,
Defendant-Respondent.*

Quebec—Suit for cancellation of insurance policy—Professional secrecy and privileged communications—Quebec Medical Act, R.S.Q. (1925), cap. 218, s. 60.

On December 29, 1931, the appellant company insured the life of J. R. Lamarche for \$12,000.00 in favour of his wife, the respondent. The assured died on October 10, 1932, and on the 5th of January following the company took the initiative by offering the sum of \$492.02 as the amount of the premiums they had already received and suing for the cancellation of the policy. The respondent on the other hand contended that the policy was valid and that she should receive the amount of the insurance.

The application for insurance, which with the policy constituted the whole contract, stated that all the declarations and answers given by the assured were true and were offered "as an inducement to issue the proposed policy". The plaintiff company in support of its request that the policy should be cancelled alleged that the insurance had been obtained by false representation and concealment on the part of the assured concerning facts of a nature to diminish the appreciation of the risk; that the answers and declarations by the assured formed part of the contract and constituted warranties; and that since these were false the policy was in consequence null. The assured had stated, for instance, in his application for insurance that he had had no illness, disease or injury and no surgical operations since childhood, that no physician or practitioner had prescribed for him or treated him in the previous five years for any ailment serious or otherwise, that he was in good health and suffered from no physical impairment. These declarations the company alleged were false, and to prove that they were false they sought to examine a Dr. Colette as witness. At the trial Dr. Colette, whether on his own initiative or after prompting by the court, stated that he could not in conscience answer the questions put to him unless the court ordered him to do so. The court refused to order him to answer, and went so far as to say that even if he had been willing to speak he would not have been allowed to do so. Subsequently the plaintiff's action was dismissed, solely on the ground that the essential allegations of its demand had not been proved.

* (1935) 59 K. B. 510.

The opinions of Judges Rivard, Hall and St. Germain in appeal are of particular importance. It was the unanimous decision of the Court of King's Bench that the appeal should be maintained, though Mr. Justice St. Germain differed in his reasons. In England the privilege of the physician with regard to information obtained by him as a result of his professional relationship with his patient is not recognized by the common law. The only privilege which exists in England is that between attorney and client. In France article 328 of the *Code pénal* makes it a crime punishable by fine and imprisonment for a doctor to reveal secrets confided to him in his professional capacity. The Quebec Code of Civil Procedure refers in article 332 to the religious or legal adviser but not to the doctor. Article 332 of that Code provides "he (a witness) cannot be compelled to declare what has been revealed to him confidentially in his professional character as religious or legal adviser, or as an officer of state where public policy is concerned". The only provision in Quebec law with respect to the physician's privilege is contained in section 60 of the Quebec Medical Act,¹ which reads in part that "no physician may be compelled to declare what has been revealed to him in his professional character". The proper interpretation of section 60 of the Quebec Medical Act was therefore the only point for the Court of Appeals to consider in deciding whether Dr. Colette's evidence had been properly excluded by the trial judge.²

The application signed by the assured contained a waiver by which he "waives for himself and any person who shall have or claim any interest in any policy issued hereunder, all provisions of law forbidding any physician or other person who has attended or examined the assured or who may hereafter attend or examine the assured, from disclosing any knowledge or information which he thereby acquired". The theory of the trial judge and of the respondent was, however, that the professional privilege of the doctor has its origin in public order and is absolute. It is neither the property of the person who gives the confidential information nor of the doctor who receives it, and the person giving it cannot therefore validly waive it. In this view the professional privilege would be for the doctor an absolute obligation to keep silent, a peremptory duty from which he could not be

relieved and must not deviate. This is a view generally accepted in France and it was the view also of Mr. Justice St. Germain in the present appeal. If such were a correct view of Quebec law, Dr. Colette of course could not properly have given evidence.

The majority of the Court of Appeals, however, was of opinion that the rule of article 60 of the Quebec Medical Act, while stronger than the mere moral objection of the English common law, was considerably less strong than this view of the French law, based as it is upon an article of the *Code pénal* that is not part of Quebec law. The rule of section 60 of the Quebec Medical Act, said the majority, is not one of public order. The professional privilege of the medical man exists only under the conditions laid down by that section and doctrines applicable in different jurisdictions are not binding authority in Quebec. In Quebec the professional privilege of the doctor is not absolute; it is relative. In this respect the doctor is in the same position as the religious or legal advisers mentioned in article 332 of the Code of Civil Procedure. At first sight the privilege appears to be the prerogative of the doctor only, but actually the patient is master of it, in this sense, that he may, in relieving the doctor, take the fact concerning which he wishes the doctor to give evidence out of the realm of a confidence.

In this respect the remarks of Mr. Justice Rivard are of particular interest. Judge Rivard said, freely translating, that the privilege of the doctor, like that of the religious or legal adviser provided for by article 332 of the Code of Civil Procedure, has for its basis the confidential nature of the fact revealed. Like the religious and the legal adviser the medical man should respect the confidence he receives and he has the right to regulate his conduct in this respect according to the dictates of his conscience. The courts cannot extract from him the secrets he has received in confidence if he believes he should keep them. But it does not follow that under the pretext of obeying the dictates of his conscience he is justified in hiding what could not be classed as a fact revealed in confidence. In accordance with this belief the Court of King's Bench has ordered the doctor to declare the names of his patients and his debtors because these names do not come "sous le sceau du secret".

The professional privilege duly invoked must be safeguarded to the degree to which the secret about which the doctor is asked has been received in confidence. In other words, the privilege covers only what the doctor has learned by reason of his professional capacity and which in its nature is confidential. The professional privilege of the doctor depends upon various circumstances which he and the court are both obliged to appreciate. It is for the court to pro-

1. R.S.Q. (1925) cap 213, s. 60. Section 60 was introduced into the Act by 9 Edward VII, cap. 55. Section 122 of the Quebec Dental Act (R.S.Q., 1925, cap. 216), provides that "divulging a professional secret" is derogatory to professional honour.

2. The Hippocratic Oath which contains the following provision: "Whatever, in connection with my professional practice or not in connection with it, I see or hear, in the life of men, which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret", is of course not binding in a court of law.—G.V.V.N.

nounce on the nature of the revelations which must be considered as confidential, to determine the "cadre" of the professional privilege; on the other hand, the doctor judges according to the dictates of his conscience what should enter into the frame thus determined. It is for the court and not for the medical man to say in each case from the circumstances and facts already known if the witness can be permitted to invoke the privilege. It can overrule his objection, for example, if he is not a doctor or if he did not learn what is asked him in the exercise of his profession, or again, as in the present case, if the witness has been relieved from the privilege.

He to whom a secret has been confided but who has been relieved from the obligation of keeping it is no longer held "sous le sceau de la confidence", for it is no longer a secret. The person who has entrusted a secret to another can relieve the latter from the obligation of keeping such thing secret. In this sense at least the patient is also master of the professional privilege. For in our system of law, the question of public order not being involved, professional privilege to be binding from the point of view of the two interested parties must be the result of a contract, and one of the parties can be relieved of his obligation by the other. If, then, the doctor is relieved of the privilege by his patient there is no longer a confidence and he can be compelled to speak. In the present case the application for insurance contained an express provision relieving the doctor from the obligation to keep secret the information he had acquired in examining the assured. The majority of the court were of opinion therefore that Dr. Colette could not invoke professional privilege, and that the trial judge should have ordered him to reply to the questions put. Mr. Justice St. Germain, while holding that the privilege of a physician is an absolute one, was of opinion that the Doctor should have been allowed, without influence from the court to judge for himself whether he should answer or not. This, Judge St. Germain held he had not been allowed to do. The appeal, therefore, was unanimously maintained and the court ordered the record to be sent back to the Superior Court so that the trial might be continued. (G.V.V.N.)

Literary pursuits employ youth, give pleasure to old age, make prosperity more prosperous, are a refuge and a solace in sorrow, amuse us when at home, do not hinder us in our duties abroad, make our nights less lonely, and in our travels and sojournings are our constant companions.—Cicero.

Abstracts from Current Literature

Medicine

Pulmonary Fibrosis and Emphysema. Miller, J. A., *Ann. Int. Med.*, 1935, 9: 219.

Pulmonary fibrosis and emphysema form the fundamental bases of all chronic lung disease. Fibrosis is an expression of the irreversible failure of the self-cleansing power of the lungs; emphysema, the irreversible failure of the pulmonary retraction power. They are almost always associated and are mutually dependent upon each other.

Damaging influences resulting in fibrosis may be infectious, chemical, physical or vascular in nature. Emphysema arises in the air spaces, the associated changes in the chest wall being secondary. Neergaard considers that the recoil of the elastic tissue of the lungs accounts for but 25 per cent of the retraction power of the lungs. The dominating 75 per cent of this power, he believes, is exerted by the surface tension which develops at the point of contact between the air and the film of moisture which covers the alveolar walls and capillary air passages. Over-expansion diminishes the surface tension and retraction power suffers, in spite of the fact that pulmonary elasticity is increasingly called upon. Luisada believes that inflammatory changes in the air spaces lead to degeneration of the smooth muscle tissue in the walls of the bronchioles and alveolar ducts and so further aid in the development of irreversible emphysema. For practical purposes the clinical evolution of chronic pulmonary disease may be separated into the bronchial phase, the pulmonary phase, and that of respiration-circulatory decompensation.

The characteristically important symptom of chronic lung disease is dyspnoea. This is not due to chemical changes in the blood, but rather to the failing coordination in the neuromuscular apparatus of respiration. Because physical and x-ray examinations of the lungs are usually so difficult to interpret, functional tests are required to estimate the severity of fibrosis and emphysema. They should also aid in the discovery of constitutionally predisposed individuals, and in the selection of suitable operative risks for thoracic surgery. The author outlines a number of the more practical tests of lung function.

Pulmonary hypertrophy is distinct from emphysema, and is evidence of the ability of lung tissue to adapt itself to demands made upon it. Hilber has demonstrated in rats that following the extirpation of one lobe there is genuine regeneration of perfectly efficient lung tissue, with corresponding new bronchi, new vessels and new respiratory alveoli.

H. GODFREY BIRD

The Diagnosis of Periarthritis Nodosa. Middleton, W. S. and McCarter, J. C., *Am. J. M. Sc.*, 1935, 190: 291.

The authors report 3 cases of periarthritis nodosa, one of which was diagnosed *ante mortem*, and discuss the various clinical features of the disease. As regards etiology, they stress the close association of the disease with the rheumatic group of diseases. They point to the frequency of lesions in the smaller arteries in rheumatic fever, to the finding of Aschoff bodies in the myocardium in periarthritis nodosa, and to a reported instance of acute chorea in the course of this disease. In view of the accumulating evidence that the clinical, pathological and bacteriological features of the two diseases, rheumatic fever and periarthritis nodosa, are so similar, the authors suggest the inclusion of the latter in the "rheumatic group" of diseases.

The pathological changes consist in a necrotizing arteritis, subacute and chronic cellular and fibrinous exudation, aneurysm formation, thrombosis, fibroblastic proliferation and repair. These lesions occur principally in the smaller arteries. Degeneration and infarction in the areas of supply are common.

Clinically, the tetrad of Meyer and Brinkman, chlorotic marasmus, polyneuritis and polymyositis, striking abdominal manifestations (e.g., cramps, vomiting, diarrhoea, melæna and perforation) and nephritis offers a logical foundation for its diagnosis. The authors feel that the disease is much more common than is believed, probably due to the spontaneous appearance of mild cases. In cases of unexplained fever, polymyositis, polyneuritis and eosinophilia the diagnosis should be entertained and confirmed by biopsy of accessible nodules or voluntary muscle.

E. S. MILLS

A Comparative Study of the Geographic Distribution of Rheumatic Fever, Scarlet Fever, and Acute Glomerulo-nephritis in North America. Seegal, D., Seegal, E. B. C. and Jost, E. L., *Am. J. M. Sc.*, 1935, 190: 383.

The authors have obtained data on the incidence of rheumatic fever and acute glomerulo-nephritis in twenty-four hospitals throughout Canada and the United States. The statistics on the geographic frequency of scarlet fever are those compiled by Schroeder and Longacre. These observers divided the cases into those occurring in latitudes 50-45°, 44-40°, 39-35° and 34-29°. It was found that the case-rate for scarlet fever diminished progressively from latitude region 50-45° to 34-29°. The yearly hospital admission rate for rheumatic fever showed a similar drop in the same latitude regions. In contrast to the diminished case frequency of scarlet fever and rheumatic fever

in southern latitudes, as compared to northern latitudes, the yearly hospital medical admission rate for acute glomerulo-nephritis did not vary significantly. The authors point out that the failure of acute glomerulo-nephritis to diminish in frequency in southern latitudes might be interpreted as supporting the hypothesis that agents other than the hæmolytic streptococcus play the chief etiological rôle in the disease, but they are not inclined to accept this conclusion. They would, rather, seek an explanation on the basis of a specific host and bacterial interaction in view of other available evidence ascribing etiological significance to the hæmolytic streptococcus in all three diseases concerned.

E. S. MILLS

Surgery

Regional Ileitis. Mixter, C. G., *Ann. Surg.*, 1935, 4: 674.

Regional ileitis is a disease of young adults. It occurs more often in males. Five of the 11 reported had had appendicectomies within the previous 18 months. The classic symptoms are fever, diarrhoea, and loss of weight. Partial obstruction of the small intestine may eventually occur. A palpable mass is usually present in the right lower quadrant. The lesion is most marked in the terminal ileum, and involves the ileocaecal valve, but not the cæcum. It becomes less pronounced as it progresses upward along the small bowel. The lesion, at the most, does not involve more than the terminal three feet of the ileum. There is a marked tendency to sinus formation. Abscess formation is common.

Crohn has grouped regional ileitis into four clinical types: (1) Those showing pain and tenderness in the right lower quadrant, cramps, fever, and leukocytosis. There may be a palpable mass. At operation the terminal ileum is reddened, thickened, and bleeds readily; the mesentery is œdematous and contains numerous enlarged lymph nodes. The appendix may be inflamed, but its mucosa is not affected. (2) This group is characterized by colicky abdominal pain, diarrhoea—occasionally with blood and mucus—slight fever, malaise, marked loss of weight, and often severe anæmia. (3) The stenotic group, the stenosis being due to thickness of the bowel wall, plus contraction following the healing of mucosal ulcers. The symptoms are those of partial small bowel obstruction. A mass is usually present. (4) Here fistulae have been formed. They may be multiple, opening both externally and internally, and resist attempts at closure.

The disease must be differentiated from ileocaecal tuberculosis, ulcerative colitis, lymphosarcoma, actinomycesis, and carcinoma. Conclusive evidence may be given by roent-

and the authors review the feedings commonly employed and the theoretical requirements of the infant in this period. The need for carbohydrate is demonstrated and salt is held to be desirable as a hydrating agent. An alkaline salt is preferable, to correct the tendency towards acidosis. Seven different prelaeteal feeding procedures were studied in 962 infants and evaluated by comparing the initial weight loss, the rapidity of recovery to birth weight, and the number in each group discharged nursing at the breast. Breast milk from foster mothers was unsatisfactory in the prelaeteal period. The results with the use of the gelatin-dextrose-salt combination did not confirm the results reported by Kugelmass. Cow's milk formulas were ineffective in combating weight loss, were not well tolerated, and in the opinion of the authors occasionally sensitize the infant to cow's milk proteins. Various sugar solutions and salt solutions and their combinations were used; the most successful was shown to be a solution of beta-lactose 2 ozs. and sodium citrate, 1 dram in 32 ozs. of water. With this feeding the average birth weight loss was lowest (4.4 ozs.) and the percentage regaining their birth weight by the fifth day was highest (62.3 per cent).

ALAN ROSS

Oto-Rhino-Laryngology

The Treatment of Otosclerotic and Similar Types of Deafness by the local Application of Thyroxine. Gray, A. A., *J. Laryn. & Otol.*, 1935, 50: 729.

A large proportion (about 50 per cent) of cases of otosclerosis and so-called dry middle ear catarrh can be greatly improved in regard to both hearing and tinnitus by the intratympanic injection of thyroxine. Cases in which the disease is in its latest stages however do not respond to the treatment. The presence of paracusis Willisii is no contraindication to treatment. The method of treatment is simple and can be carried out without difficulty by any otologist. It is practically painless, or altogether so, and does not interfere with the patients' daily activities. The drum is anaesthetized by instilling 15 to 20 drops of a solution composed of 10 parts of cocaine hydrochlorate and 90 parts of fresh aniline for five minutes. This is then wiped out. A large cork is put between the patient's teeth, to prevent him swallowing, and 1/128 gr. of thyroxine in 4 minims of distilled water is injected through the tympanic membrane by a fine hypodermic needle into the middle ear through the posterior portion of the membrane. This is all done with an aseptic technique.

The rationale of the treatment depends upon the writer's view that otosclerosis is the result of a diminished blood supply to the organ of

hearing, consequent upon a gradual failure of the vasomotor responses. The action of thyroxine applied locally is to produce an active congestion without inflammatory reaction for a long period of time.

It is not yet possible to say how often the treatment may have to be repeated. The improvement, when it occurs, lasts in some cases for several weeks, but sooner or later the effects must be expected to pass off. The present paper is of the nature of a preliminary communication.

GUY H. FISK

The Demonstration of Particles of Malignant Growth in the Sputum by Means of the Wet-Film Method. Dudgeon, L. S. and Wrigley, C. H., *J. Laryn. & Otol.*, 1935, 50: 752.

This paper summarizes the work of eight years on 58 cases of malignant disease of the lungs or respiratory tract. Fresh sputum was fixed by Schaudinn's method and then stained with Mayer's hæmalum. The specimen is then counterstained with eosin. The blood-streaked sections usually contained the malignant cells. These appeared either as oat-shaped cells or immature squamous cells in plaques or clusters. No diagnosis was made unless plaques or clusters were seen. In 68 per cent of the cases proved to be carcinoma of the larynx the diagnosis was also made from the sputum, and in the majority of them the histological type diagnosed. In one case a mistaken diagnosis of malignancy was made, the case being one of an inflammatory nature with nasal polypi.

GUY H. FISK

Anæsthesia

Premedication. Green, F. W., *Brit. M. J.*, 1935, 2: 780.

The author maintains that nervous patients and children should receive some form of sedative drug treatment in order to lessen the mental ordeal which must occur whilst waiting to be taken to the operating theatre. He considers sedatives in turn as (a) drugs given by mouth; (b) drugs given intravenously and subcutaneously, and (c) drugs administered by the rectum. Among those given by mouth he mentions chlorotone and the barbiturates, sodium amytal and nembutal. He recommends fairly large doses of the barbiturates, as small doses are very uncertain and variable in their action. Drugs given intravenously for premedication, such as the barbiturates mentioned above, had best be given by mouth, as overdosage is less likely in this case. Morphine should be given less frequently and in smaller doses, on account of its effect as a respiratory depressant.

Among the drugs administered by the rectal route paraldehyde and avertin are the most

commonly used. He does not advise paraldehyde, as it appears to cause small hæmorrhages in the mucous coat of the stomach. Avertin is the most suitable of the drugs so used, and is the best premedicant that we have at present. It should never be given in dosage in excess of 100 mg. per kilo of the body weight.

Atropine should be used in premedication except in cases where the metabolic rate is high.

ARTHUR WILKINSON

Therapeutics

Peripheral Nerve Block in Obliterative Vascular Disease of the Lower Extremity. Smithwick, E. H. and White, J. C., *Surg., Gyn. & Obst.*, 1935, 60: 1106.

A technique for alcohol injection of the sensory nerves of the lower extremity, in order to relieve the intense rest pain in cases of advanced obliterative vascular disease, was reported by Smithwick and White four years ago. The present communication reports the results of the treatment of 50 patients by this method, and further elaborates on the technique of operation. Nerve block may serve to increase the peripheral circulation because the anæsthetic area is also deprived of its vasoconstrictor nerves. If more than one nerve must be blocked, as is usually the case, the operation should be done in multiple stages. Simply crushing the exposed nerve is as effective as alcohol block, although the nerves regenerate more rapidly. Since introducing this procedure into their clinic the authors claim that the number of necessary major amputations has been more than halved, and the number of successful minor amputations doubled. The results are better in patients with thrombo-angiitis than in the arteriosclerotic group. This operation should be tried before resorting to a major amputation, unless hopeless gangrene or infection sufficient to endanger the life of the patient is present. It is indicated in the advanced stages of obliterative vascular disease after other conservative methods have proved inadequate.

FRANK TURNBULL

The Harmful Effects of Sodium Perborate Preparations. Williams, C. H. M., *J. Canad. Dental Ass.*, 1935, 1: 267.

The author, who is a dental surgeon, points out that the use of sodium perborate as a mouth wash may give rise to troublesome oral lesions. This substance is being used extensively and its harmful potentialities should be recognized. The effects are usually of an escharotic nature, with symptoms of a chemical burn, such as drying, puckering, or tingling of the mucous membrane. One of the most striking effects is the so-called "hairy tongue", mat-like patches of long hair-like papillæ being formed on the posterior third of the tongue. Food may be entangled with these and a foul odour to the breath be produced.

It is thought that these results depend on (a) personal idiosyncrasy to the perborate; (b) the presence of impurities in it, such as sodium hydroxide, which is used in the commercial preparation; or (c) the strong essential oils used as flavourings.

The treatment is simply by means of a mild alkaline or saline mouth wash, or merely by the withdrawal of the perborate.

H. E. MACDERMOT

Dementia Paralytica — Results of Malarial Treatment in Association with other Forms of Therapy. Solomon, H. C. and Epstein, S. H., *Arch. Neur. & Psych.*, 1935, 33: 1008.

In this excellent article the authors endeavour to evaluate the results of malarial therapy and to determine the best methods of associated therapy. Pointing out how difficult it is to assess the results reported in the literature due to the immense variability in many important factors such as the type of case material selected, they present their results in a series of 173 cases. This series was entirely unselected and comprises all patients given malaria from 1928-31 at the Boston Psychopathic Hospital.

The results of treatment are analyzed from two points of view (1) the clinical status (2) the observations on the spinal fluid. Estimating their results on the patient's ability to work, good recovery was found in 36.4 per cent and additional improvement in an additional 27.1 per cent. The cerebrospinal fluid showed a completely normal fluid in 36.7, great improvement in 20.7, mild improvement in 18.3. The writers feel that the process of dementia paralytica can be arrested in the vast majority of cases if the disease has not progressed too far. This statement is based on the high percentage of normal or nearly normal spinal fluids obtainable over a period of years.

The best method of treatment cannot be determined at the present time. It is, however, the author's impression that a combination of other methods with malaria yield better results than malaria unaided.

G. N. PATERSON-SMYTH

The Value of Colloidal Sulphur in the Treatment of Chronic Arthritis. Rawls, W. B., Gruskin, B. J. and Ressa, A. A., *Am. J. M. Sc.*, 1935, 190: 400.

The authors have studied the effects of colloidal sulphur on 200 patients suffering from different types of clinical arthritis. The sulphur administered was an aqueous solution of colloidal sulphur (Sulisocol) containing 10 mg. per c.c. From 10 to 30 mg. were given twice weekly, either intravenously or, if reactions occurred, intramuscularly. The initial dosage was 10 mg. twice weekly, increased to 20 or 30 mg. if the smaller dose did not produce a definite favourable effect upon the arthritis. Only a few pa-

tients showed toxic symptoms after the injection, such as fatigue, drowsiness, loss of appetite, headaches and increased pain, swelling or stiffness of the joints. The patients showed marked improvement in focal and constitutional symptoms, as indicated by less fatigue, an improved appetite, and a gain in weight. In addition to clinical and focal improvement, the sedimentation rates and non-filament cell counts were considerably reduced, a further evidence of amelioration of the disease. The cases most resistant to treatment with sulphur are young people with rheumatoid arthritis and others with normal cystin content of the finger nails. The rationale of sulphur therapy in chronic arthritis is briefly as follows. It is believed by Pemberton and others that the tissues in the arthritic, and particularly the joint tissues, suffer from poor oxidation and nutrition as a result of defective circulation. Sulphur as glutathione, an important agent in cellular oxidation and reduction, has been found deficient in this disease. Improper metabolism or deficiency of this compound in the joint tissues allows the uncontrolled action of the noxious agent in the arthritic. The administration of sulphur prevents the normal body sulphur complexes from being dissipated. This theory is supported by the frequent occurrence of low blood glutathione and low cystin content of the finger nails in cases of chronic arthritis.

E. S. MILLS

Pathology and Experimental Medicine

Interpretation of Abnormal Dextrose Tolerance Curves Occurring in Toxæmia in Terms of Liver Function. Soskin, S., Allweiss, M. P. and Mirsky, I. A., *Arch. Int. Med.*, 1935, 56: 927.

The question is raised as to the reason for decreased carbohydrate tolerance in toxæmias as shown by the disturbed tolerance curve, whether it is an interference with the action of insulin from any source, or an upset of the liver's function in maintaining the blood sugar level. Experimental work with depancreatized dogs shows that if they are supplied with dextrose and insulin to balance each other, the tolerance curve is normal. On the other hand, if the liver is removed a "diabetic" tolerance curve is reported under the same balance of dextrose and insulin. Apparently the normal response of the liver to administration of large amounts of dextrose is to decrease its own output of blood sugar and so prevent a "diabetic" tolerance curve. The authors were able to demonstrate this theory by experiments on depancreatized dogs. Diphtheria toxin was used. Using scientific controls over each step they found that in normal animals administration of toxin caused

a prolongation of the tolerance curve, and that this was even more "diabetic" in depancreatized dogs. The pancreas then has no part in this "reaction" to toxæmia. Changes were found in the liver. Phosphorus, by its action on the liver, also produces this effect. Hence the administration of dextrose with its stimulating effect on liver function (or sensitivity to insulin) is logical, both in toxæmias and in diabetes itself.

P. M. MACDONNEL

Changes in the Blood and Circulation with Changes in Posture. The Effect of Exercise and Vasodilatation. Youmans, J. B., Akeroyd, Jr., J. H. and Frank, H., *J. Clin. Invest.*, 1935, 14: 739.

Krogh, Landis and Turner have remarked that the erect human is always close to œdema. Some of the authors of the present paper have previously shown that the primary factors concerned in limiting the loss of fluid from the blood in the standing-still position appeared to be an increasing concentration of plasma proteins, with a resulting rise in colloid osmotic pressure, and probably an increasing tissue pressure. The present paper deals with (1) the effect of muscular activity on the changes in the blood resulting from the erect posture; (2) changes in the circulation in the feet and legs in the erect posture, quiet and moving, as shown by changes in surface temperature; (3) a comparison of the circulation tissue in the quiet and moving leg in the erect posture; and (4) the influence of vasodilatation on the changes in the composition of the blood which occur on standing, which may act as secondary factors in the above-mentioned mechanism.

As to the first, it was found that in the erect posture active muscular movements of the leg are accompanied by less concentration and less rise in the colloid osmotic pressure of the blood in the moving leg than in the other leg kept motionless. At the same time there is a smaller increase in volume of the moving leg, and in some cases an actual decrease compared with its volume in the reclining position. In the quiet leg in the erect posture the capillaries of the toe are dilated and the number of open capillaries increased.

Secondly, it was found that the assumption of the erect posture is usually accompanied by a prompt and significant fall in the surface temperature of the feet and legs. This drop occurs in a warm as well as in a cool environment, and in the muscularly active (pedalling) leg as well as in the quiet leg, in spite of a presumably greater and more rapid total blood flow in the former.

Thirdly, in the erect posture the circulation time in the quiet leg is much longer than in the reclining position. On the contrary, the circulation time in the moving leg is often shorter than

in the reclining position and hence often several times shorter than in the opposite quiet leg.

Finally, it was found that heating the fore-arms and hands was accompanied by a rise in the surface temperature of the feet with the subject erect, overcoming the drop in surface temperature which occurs in the quiet standing posture. Vasodilatation resulted either in a greater or a lesser concentration of the blood in the feet and legs in the erect posture than occurs without vasodilatation. In either case the total volume of fluid filtered into the tissues of the leg appeared to be greater with vasodilatation.

JOHN NICHOLLS

On the Nature of the Substance(s) Producing Pain in Contracting Skeletal Muscle: Its Bearing on the Problems of Angina Pectoris and Intermittent Claudication. Katz, L. N., Linden, E. and Landt, H., *J. Clin. Invest.*, 1935, 14: 807.

The mechanism of the production of pain in angina pectoris and intermittent claudication has been the subject of many studies during the last century and a half. Interest has been re-awakened by Lewis and his collaborators, who showed that the continuous pain from contracting ischæmic skeletal muscle of normal subjects is due, not to vascular spasm but to the development by the contracting muscle of a factor producing pain, confirming a point of view proposed by earlier workers in this field during the 18th century. The present investigation was carried out in an attempt to discover the nature of this factor.

The authors found that circulatory slowing caused a decrease in the amount of exercise required to cause pain, the effect being disproportionately greater at high degrees of circulatory slowing. The amount of blood trapped in the arm played an insignificant rôle. Circulatory slowing had its greatest effect at the fastest rates of exercise. Increasing the rate of exercise led to a decrease in the amount of exercise required to cause pain when the circulation to the limb was unobstructed. Slowing this circulation led to a diminution of this effect of the rate of exercise. This effect of the rate of exercise disappeared when the circulation in the limb was stopped. Exercise of a large group of muscles of the leg to the point of pain had a two-fold action on the amount of exercise required to cause pain in a subsequent arm-exercise; viz., (1) by an action on the central nervous system it augmented the amount of exercise required to cause pain, and (2) by an action through transport of blood from the exercised legs to the muscles of the arm it decreased

the amount of exercise required to cause pain. Special procedures were required to separate these two effects. Increasing the CO₂ content of the blood in the arm decreased the amount of exercise required to cause pain. Injection of large amounts of sodium bicarbonate increased the amount of exercise required to cause pain. Ingestion of sodium bicarbonate also tended to alleviate the pain of patients with intermittent claudication and of those with angina pectoris. The effects of these procedures on neuromuscular fatigue were not related quantitatively to their effects on pain. With certain procedures, such as the ingestion of sodium bicarbonate, the effects were opposite.

The main conclusions that the authors made from these findings were:—

1. The time allowed for recovery between contractions in a rhythmically contracting muscle alters the rate of accumulation of the substance(s) leading to pain, implying the pain-producing substance(s) is(are) a product of metabolic muscular activity.

2. The substance(s) causing pain diffuses into and out of the blood stream. It is non-volatile, since it operates even after passing through the lungs.

3. The appearance of pain in the muscle is dependent not only upon the local production of pain-producing substance(s), but to some extent upon the transport of such substance(s) from other regions.

4. The non-volatile, pain-producing substance(s) appears to be acid in character; at least its action is retarded by alkaline substances.

5. Acids and bases exhibit summation of effect with the pain-producing substance(s) by changing the pH of the end organs, by altering their buffering capacity, or in both ways.

6. Training tends to lessen the action of the pain-producing substance(s), probably by altering the buffering capacity of the muscle concerned.

7. The variability in the appearance of fatigue, which is independent of pain, plays an important rôle in forestalling the appearance of pain under certain circumstances.

JOHN NICHOLLS

The number is especially small of those who, either by surpassing genius, or by remarkable erudition and knowledge, or by being endowed with either, have enjoyed the opportunity of deciding what path of life they prefer to follow.—Cicero.

Obituaries

Dr. Charles Robert Cuthbertson, of Toronto, died on December 19, 1935, in his seventy-first year. He was a graduate of Victoria University, Toronto (1886).

Dr. Cuthbertson was a son of the late R. S. Cuthbertson, and was born and educated in Toronto. He had practised for 50 years in that city. For many years he was active in Y.M.C.A. work, and an enthusiastic hand-ball player. Dr. Cuthbertson was a member of the Board of Trade, of the Canadian and Canada Lawn Bowling Clubs, also a member of Trinity United Church.

Surviving are his wife, formerly Miss Lily Augusta Philp; four daughters, Muriel, Mrs. H. P. Eckart, Mrs. J. W. Scott, Mrs. Kenneth E. Perfect; one sister, Mrs. George G. Webber, Vancouver.

Dr. J. G. Day, of Gravenhurst, Ont., died suddenly on December 15, 1935, from a heart attack. He was forty-nine years old. Doctor Day was a graduate of the University of Washington, D.C., and came to the National Sanatorium at Gravenhurst twenty-two ago for treatment. He was head of the x-ray department in which work he was considered an authority. In college he took keen interest in athletics and music. For a few years he conducted the sanatorium orchestra. His remains were sent to Baltimore, Md., where his mother and brother reside.

Dr. Alexander A. Forbes, of North Vancouver, B.C., pioneer physician and chemist, and one of the discoverers of the famous Britannia copper property and other mining areas in southern British Columbia, died suddenly on December 4, 1935. He was aged 85.

Dr. Forbes was one of the earliest settlers in the Howe Sound area. Arriving in Vancouver in 1886, he became doctor to the Indians of Howe Sound and the lower coast, and built a small cottage at what is now Hopkins Landing. An adventurous career had been indicated for Dr. Forbes long before he came here, however. Born in Scotland, he entered the British navy at the age of 13, and left the service ten years later, after cultivating a taste for chemistry. Settling in Connecticut, he soon became a school teacher, married, and prepared to give up adventuring for test-tubes and classrooms. However, he took a medical course, obtained his degree, and from that time on occupied himself with one or the other career, interspersing it with a little prospecting on the side.

Shortly before 1900 the doctor and his wife settled in Minnesota. In 1912 he returned to Vancouver, going to Powell River as company doctor. He retired about 1930 to his home in British Columbia, where he has lived for twenty years.

Dr. Forbes' wife died ten years ago. He has no survivors.

Dr. John Duncan MacCallum, Registrar of the Royal Victoria Hospital, Montreal, died suddenly on December 27, 1935, in his fifty-fifth year.

He was the son of Dr. Duncan Campbell MacCallum and Mary Josephine Guy, and was born in Montreal on December 6, 1881. He graduated from McGill University in 1905. During his college days Dr. MacCallum was a noted athlete, playing on the senior football, hockey and tennis teams. He was a member of the Kappa Alpha fraternity.

Dr. MacCallum started practice in Montreal, and then moved to Sherbrooke, where he spent five years, resuming practice in Montreal in 1913. He married Miss Florence Wynn Farwell, of Sherbrooke, in that year. In 1927 he was appointed registrar-in-chief of the Royal Victoria Hospital, and had been chief medical adviser to the Bank of Montreal since 1930. He had been also

medical adviser to the Standard Life Insurance Company for many years.

Dr. MacCallum was a member of the Mount Royal Club, the University Club and the Royal Montreal Golf Club. He is survived by his widow, one son, one daughter and a sister, Miss Esther MacCallum, all of Montreal.

Dr. William James McCollum, of Toronto, died on December 25, 1935, after a long illness, aged sixty-three.

Dr. McCollum was born in Toronto, on July 12, 1872, and was a son of the late Dr. J. H. McCollum, one time Medical Superintendent of the old Toronto General Hospital. His early education was received at the public schools and he matriculated from Parkdale Collegiate. He graduated from the University of Toronto in 1894 and was the Gold Medallist of his year. Following further post-graduate work at the university, he established himself in practice at the corner of Jarvis and Shuter Streets, where he remained until 1924, and since then had been located on St. Clair Avenue West.

Dr. McCollum was a member of the teaching staff of the university from 1897 to 1919. In 1897 he was appointed to the medical staff of St. Michael's Hospital, and was active at this institution for many years. Some years ago he was appointed a consulting physician to that hospital. Always a versatile teacher of medicine and the primary sciences, he was interested in medical education, and for the past twelve years had been a member of the Senate of the University of Toronto.

Besides carrying on a large medical practice, for the past twenty years Dr. McCollum had been physician in charge of the Medical Division of the Bell Telephone Company. For forty years he had been the chief medical examiner for Toronto of the Metropolitan Life Insurance Company of New York. He was also an active participant in Masonic activities in all its branches.

In 1898 he married Louisa Mabel, only daughter of James Lumbers of Toronto. He is survived by his wife, two sons; John H. of Alton, and Dr. James L. of Toronto; and four daughters; Mrs. H. B. Harding, Mrs. E. Manson Milne, of Port Nelson, Mrs. John W. Millar and Mrs. Donald C. Wilson, both of Toronto. He is also survived by three brothers: Dr. John A., Charles S., and Allan C., all of Toronto; and one sister, Miss Edith M. McCollum, also of Toronto.

Dr. Israel M. Lovitt passed away recently at Yarmouth, N.S., at the age of 73, after an illness of some years. He graduated from Harvard in 1885. On the death of his father he came into a considerable fortune. His chief interests were in shipbuilding, travel, and farming. He contributed generously to the Yarmouth and Digby Hospitals.

Dr. P. P. McCormick, formerly medical examiner for the Montreal Athletic Commission, died at his residence on December 26, 1935, in his sixty-sixth year.

Dr. McCormick was born in Montreal and educated at the Jesuits College and the St. Hyacinthe College. He studied medicine at Laval University, Quebec (M.D., 1890), and came to Montreal at the age of 21, practising there ever since.

Surviving are his wife; one brother, D. J. McCormick; and three sisters, Mrs. J. P. P. Murphy, Mrs. T. L. Dixon, and Miss Mary McCormick.

Dr. David Cummings McLaren, of Ottawa, a well known homœopathic physician, and a resident of the Capital for the past 45 years, died on December 30, 1935, in his seventy-sixth year.

Dr. McLaren was a son of the late Mr. and Mrs. William McLaren, who came to live in Canada when he



WHEN WINTER WINDS BLOW

January—February blizzards are "just around the corner", waiting to catch the unwary, those unfortunates whose low resistance to respiratory infections constitute a never-ending problem for the physician.

Clinical experience does give us, however, sound reason to believe that vitamin A and D therapy builds up a definite resistance to the inroads of infection of the epithelial tract.

Alphamettes provide an excellent medium for vitamin A and D therapy. Each small 3-minim capsule exhibits the complete vitamin value of 3 teaspoonfuls of Cod Liver Oil* and, being a simple defatted concentrate of Cod Liver Oil, retains the same natural vitamin A and D ratio that long clinical experience has established as being sound and practical.

The usual prophylactic dose is 1 to 3 capsules daily. We will be glad to mail you literature.

* Ayerst biologically-tested Cod Liver Oil conforms with the requirements of the U.S.P. XI (revised 1934).

AYERST, McKENNA & HARRISON
Limited

Biological and Pharmaceutical Chemists

MONTREAL

CANADA

was only four-years of age. The family first established residence at Montreal, and later moved to Guelph.

Educated at the Galt High School, he studied medicine at McGill University, and graduated at the age of 21 (1880). Following his graduation he made special studies in homœopathy at Philadelphia, and for four years he practised as homœopathic physician at Galt and Brantford, later establishing residence in the Capital.

Dr. McLaren was twice married. His first wife was Mary Howell, who died some six years ago, and his second marriage was to Annie Christina Farrara, who survives. He is also survived by two sons, Dr. Kenneth McLaren, of Toronto, and W. L. McLaren, Ottawa; two sisters, Mrs. J. N. Babson, Seattle, Wash., and Dr. Laura McLaren, of Guelph.

Dr. Mary Elizabeth MacLeod, of Saint John, N.B., died on December 12, 1935, at the Saint John General Hospital, following a fairly prolonged illness. Dr. MacLeod was 83 years of age. She was a graduate of the Woman's Medical School, Northwestern University, Chicago, and had been Superintendent of various hospitals in Detroit and later in Idaho. She was one of the pioneer women physicians in New Brunswick.

Dr. Ernest Augustus McDonald, of Toronto, died on December 12, 1935, from a stroke. He was born in Toronto, the son of John McDonald, and educated in Dufferin School and Harbord Collegiate. He graduated from the University of Toronto School of Medicine (1905) and commenced practice in Seattle, Wash. Twenty-five years ago he returned to Toronto.

Dr. McDonald was one of the founders of the East General Hospital and a former Chief Surgeon in that institution. He was at one time President of the Academy of Medicine, Toronto.

His widow, one daughter, Miss Susan; two sisters, Evelyn and Margaret; and one brother, Percy, survive.

Dr. S. N. Miller. The death of Dr. S. N. Miller, of Middleton, N.S., at the age of 75 has removed one of Nova Scotia's oldest practitioners. For years he had been prominent in Valley medical circles. He was a close friend of the late Dr. Murdoch Chisholm, who regarded him as one of the best diagnosticians in the province. He was a pioneer in the open air treatment of tuberculosis. He graduated from New York University in 1875.

Dr. L. J. O'Shaughnessy, of Halifax, N.S., a graduate of McGill University in 1898, died during December at the age of 66. After graduation he came to Halifax where he practised his profession until the time of his death.

Dr. Theodore James Park died at the family home at Amherstburg, Ont., on January 2, 1936, after an illness of some seven weeks. He was in his 80th year.

Dr. Park was born in Amherstburg, the son of Mr. and Mrs. Theodore James Park, the latter formerly Miss Kevill, both members of pioneer families. The family is also connected with the Baby family, pioneer French settlers.

He obtained his early education in Amherstburg schools and attended Upper Canada College, later taking a medical course in what is now the medical school of the University of Toronto, where he graduated M.B. (1879). After practising for a while in the Hospital for Sick Children in Toronto, Dr. Park returned to Amherstburg. He took a keen interest in civic affairs and was mayor of Amherstburg 52 years ago. Later he served on the public library board and for 25 years was medical officer of health, quitting that post last summer.

Dr. Park never married. His only survivor is his sister, Miss Elizabeth, with whom he lived in the home where both were born.

Dr. William Frederick Park, of Amherstburg, Ont., died of heart failure on January 3, 1936, at the age of 64. Two days previously Doctor Park had attended his close friend and namesake, Dr. T. J. Park, in his fatal illness. Thursday night he was stricken himself with a heart attack. He insisted on rising next day to go about his routine. A half-hour after visiting the last patient on his round he died.

For 20 years Dr. Park served as mayor of Amherstburg, moving there 35 years ago from Harrow, a few miles east. Born in Chatham, he matriculated at 16 and obtained his degree of M.B. at the University of Toronto when he was 20. Unable to practise at that age, he taught astronomy at the university for another year. Dr. Park began his medical career in Harrow in 1893.

Dr. Park was an accomplished bass soloist and was organist of Christ Church in Amherstburg for many years. He was instrumental in obtaining a public library for the town and was interested in the historical society and the horticultural society.

He is survived by his widow, formerly Amada Rachel Rowsell, of Chatham, and three daughters, Mrs. Arthur Gosselin, of Windsor, and Mrs. H. Lester Hamilton and Mrs. Sybil Morgan, of Amherstburg.

Dr. Montague Albert Blowers Smith, of Dartmouth, N.S., died in his sleep on November 13, 1935. He was seventy-five years of age.

Born in the Garden of the Gulf, a son of Rev. John Smith, he was by inheritance a loyal supporter of the Church of England. Following graduation from King's College, Windsor, he proceeded to Bellevue Hospital Medical School, New York, where he took his degree in medicine. New York at this time had not yet accepted the Listerian teaching, and one of the first problems facing Dr. Smith when he came back to his native land to practise was to learn the principles of antiseptic technique, which even then had taken firm hold in Nova Scotia. At various times in the years following he returned to his school for inspiration and instruction, and will be long remembered amongst his pupils and confrères as an exponent of the teaching of Max Einhorn.

In Halifax he opened an office on Bishop Street, and, practising in the town of Dartmouth as well, acquired a large clientèle. In 1901 he was appointed to the staff of the Victoria General Hospital. For many years he was a teacher of students of Medicine, first in the Halifax Medical College, and later in Dalhousie University.

His later years were marked by well merited acts of appreciation on the part of his confrères. He was made an Honorary Member of the Nova Scotia Medical Society, and during his fiftieth year in practice was tendered a complimentary banquet by the Halifax Branch of the Nova Scotia Medical Society.

During a long life he maintained the keenest interest in the progress of medicine. When seventy years of age he went to London, where he spent weeks of profitable study at Guy's Hospital. He was again a visitor to Great Britain with the Canadian Medical Association on its memorable tour, visiting hospitals and sight-seeing with all the zest of youth.

And as with the Arabian Sage the Call came in the night watches; quietly it was heard and peacefully obeyed. A long life was over. There has passed from the medical profession of Nova Scotia one whose name and works will be long remembered, and who in his life, playing many parts, gave to all an everlasting example of interest and devotion.—From *The Nova Scotia Medical Bulletin*.

Dr. J. T. Wright died of heart disease in Winnipeg on January 6, 1936, in his 60th year. He was born at Metcalfe, Ont., the son of Rural Dean Wm. Wright and nephew of Archbishop de Pencier, Vancouver. He graduated in medicine from Queen's University in

IN INTESTINAL INVOLVEMENT

Symptoms are often so similar in various types of intestinal involvement that many times the radiographic findings are the deciding factor in early diagnosis and differentiation of the actual situation. It is unwise to wait for the advanced symptoms to definitely establish the diagnosis, for it means loss of valuable time—even the prognosis may be altered.

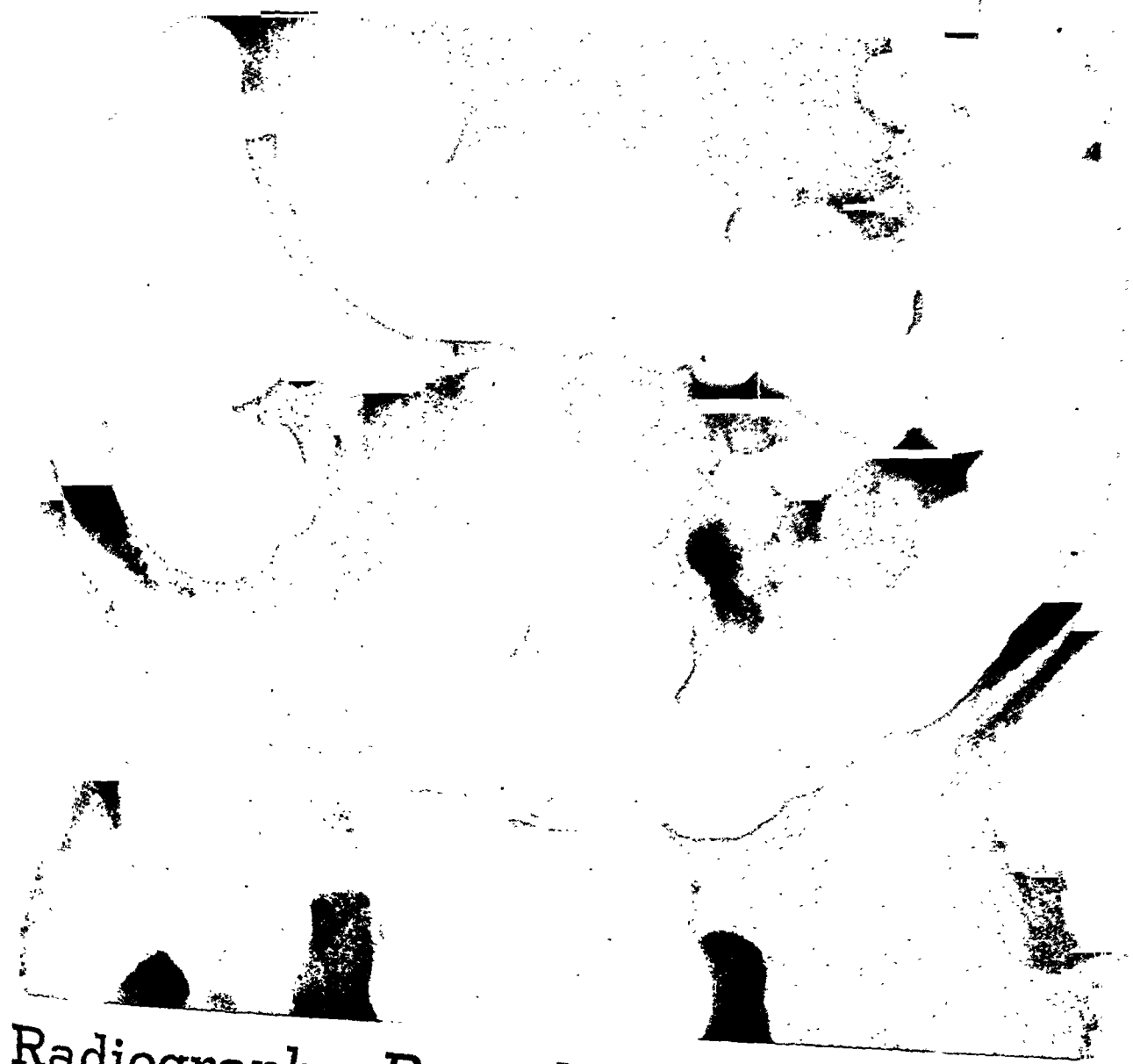
Radiography is indicated for con-

fimation and to determine the degree of involvement if any of the following conditions are suspected:

Ulcerative Colitis	Diverticulosis
Polyposis	Carcinoma
Ileocecal Tuberculosis	
Congenital Anomalies	

Request that your radiologist make a complete series of radiographs in all cases where physical symptoms point to intestinal disease.

CANADIAN KODAK CO., LIMITED • Toronto, Ontario



Radiographs Provide Diagnostic Facts

1900 and practised in Manitou, Man., from 1904 till 1911, when he was appointed to the charge of the Government Hospital on Queen Charlotte Islands, B.C. In 1916 he went overseas as Medical Officer of the 184th Winnipeg Battalion, and in France was attached to railway troops. On returning to Winnipeg he was appointed to the Pensions Board and was examining officer at Deer Lodge Military Hospital. He is survived by a widow, two sisters and two brothers. Doctor Wright was a man of genial disposition and sterling integrity and possessed the confidence of his patients in a marked degree.

News Items

Alberta

A special meeting of the Board of Directors of the Canadian Medical Association, Alberta Division, was held in Red Deer on December 4, 1935. At this meeting, it was unanimously agreed that the combined fee for 1936 covering all the activities of the College of Physicians and Surgeons as well as those of the Alberta Division, and in addition a membership in the national organization, including subscription to the *Canadian Medical Association Journal*, would be twenty dollars (\$20.00). This is five dollars (\$5.00) less than the combined fee five years ago. The College of Physicians and Surgeons sent out notices in January to all the members as above.

The meeting also decided to put on an intensive campaign for the establishment and encouragement of district associations and local societies. The hope is that from the larger centres men may be sent to these organizations, who would present scientific papers from time to time.

The Board urged upon the conference of Premiers, held in Ottawa, the importance of making a national survey of the needs of the people, in the matter of proper medical care and attention and the present existing facilities for meeting that need, before any one province or the Dominion should launch any scheme which might prove unwise or involve a great expenditure of the taxpayers' money.

The Council of the College of Physicians and Surgeons at its November, 1935, meeting went on record as to the importance of notifying coroners in all cases of sudden death where the circumstances might indicate any reasonable doubt as to the cause of the death. The Council thought it advisable and in the interest of the public that only medical men should be employed as coroners.

It was regretted by the Council, that the vital statistics of the various provinces were not collected in such a way as to be of the greatest value. In many instances death certificates are signed by other than medical men, and frequently by persons who have only a hear-say knowledge of the incident, the reporter giving the cause of death from information he received from a neighbour.

It is reported that the following men have been recently registered in the Province of Alberta to practise medicine: Kritzwiser, Orville E., Lake Louise, Alta.; Carnat, Morris, Ponoka, Alta.; Foy, Edward Francis, Edson, Alta.; Gung, Edward Basil, Victoria, B.C.; Wood, Lorne George, Lamont, Alta.; Cabot, Clyde Marcus, Calgary, Alta.; Rosenfeld, Victor L., Elnora, Alta.; Reeves, Adna Anson, Lacombe, Alta.; Farr, John Thomas, Edson, Alta.

G. E. LEARMONTH

British Columbia

According to press reports the revision of the proposed Health Insurance Bill includes among other changes a lessened number of employees to be covered by Health Insurance and the beneficiaries to be limited to those whose income is less than \$1,800 yearly. It is definitely stated that no cash benefits will be paid. The Health Insurance commission will be composed of preferably three but not more than five persons, with representatives of both employers and employees. A technical advisory council of six members will be created and no provision is to be made for an appeal board. Benefits are to start one month after a person begins paying into the scheme.

The British Columbia Loggers Association has submitted a brief to the government opposing the present Health Insurance plan on the ground that it will mean an increased pressure on the employers which will be augmented year by year. It is felt that Health Insurance should not be established in British Columbia until it becomes a national policy all over Canada, in order that the highly protected industries of eastern Canada should be compelled to contribute as well as the basic industries of British Columbia, which do not benefit by protective tariffs but must sell their products in the open markets of the world.

Proposals submitted by the Victoria Medical Society that a flat monthly rate be paid for the care of indigent patients has been definitely refused by the municipalities of Oak Bay and Saanich, adjoining the city of Victoria. The Saanich Municipal Council stated through its reeve that if their own medical officer could not handle all the work the employment of a part-time health officer in addition should be undertaken.

The Board of Directors of the Vancouver General Hospital have decided upon the employment of Dr. S. S. Goldwater, Health Commissioner for New York, and internationally known consultant on hospital construction, to make an immediate survey of the Vancouver General Hospital in an effort to overcome the desperate overcrowding conditions and to establish a program which will provide satisfactory facilities for the next twenty-five years. D. E. H. CLEVELAND

New Brunswick

The New Brunswick Bureau of Health met at the Health Centre in Saint John on December 10th and 11th. Dr. William Warwick, Chief Medical Health Officer, was general chairman. This meeting of the bureau was the first to be held since Hon. Dr. W. F. Roberts assumed the portfolio of Minister of Health. In a review of the notifiable diseases in the province for the year ending October 31st, last, it was noted that the number of cases of diphtheria reported was the lowest in the history of the province. This is directly due to the general use of toxoid inoculations throughout the province among school children, 76,000 immunizations having been completed since 1929. There is a slight advance in the number of cases of typhoid over that of the previous year. There had been no outbreak of infantile paralysis, although there were isolated cases in York and Victoria Counties. Dr. R. A. H. Mackeen, Provincial Pathologist, reported that there was a marked increase in the amount of work done during the year. This is particularly true in relation to tissue examinations.

Hon. Dr. W. F. Roberts, at this meeting, received the delegation from the New Brunswick Medical Society, composed of the Chairman, Drs. J. M. Barry, A. E. Macaulay, and A. S. Kirkland. With them was discussed the provincial program in the fight against cancer, which it was determined would be along educational lines. It was hoped that in each community a selected group of

A cholagogue that is exceptionally effective, indicated in all cases of liver disturbances, acute or chronic icterus, except those of a syphilitic nature, or those where surgical intervention is necessary. Also indicated for chronic cholecystitis, etc.

Mode of Use:

One to three teaspoonfuls of granules dissolved in half a tumbler of tepid water, to be taken 30 minutes before breakfast.

Literature and samples
on request.



Soluble
granules
125 grammes.

AGO

The BISMOL LABORATORY
MONTREAL

DISTRIBUTORS

TORONTO: Drug Trading, National Drug & Chemical Co. Limited.
MONTREAL: Lyman's Limited, National Drug & Chemical Co. Limited.
WINNIPEG and REGINA: National Drugs Limited.
CALGARY and EDMONTON: Alberta National Drugs Ltd.
VANCOUVER: B. C. Drugs Limited.
HALIFAX and ST. JOHN: National-Canadian Drugs Ltd.

M

All applications and case reports must be filed at least sixty days before the date of examination. For information, syllabuses and application forms please write at once to Dr. Thomas D. Allen, Assistant Secretary, 122 South Michigan Ave., Chicago, Ill.

General

The First International Conference on Fever Therapy will be held in New York City in September, 1936. The use of fever induced by physical and other agencies as a therapeutic procedure has received universal attention in the past few years. The conference will aim to collect and crystallize available data in this field. Therapeutical, physiological and pathological phases of fever will be discussed.

The suggestion for this conference originated with a group of interested European physicians. Five national conferences have been held in the United States of America. The first three sessions met at Rochester University Medical School in 1931, 1932 and 1933. The fourth assembled at Columbia University College of Physicians and Surgeons in 1934. The fifth was held in 1935 at Miami Valley Hospital, Dayton, Ohio.

It is planned to translate abstracts of all the papers into French, English and German. In order to make the printed copies of the transactions available for the conference, it is necessary that manuscripts and abstracts be sent in not later than June 1, 1936. Those interested in participating are requested to make early application.

Further information concerning the conference may be obtained from the Secretary.—Baron Henri de Rothschild, Chairman, Paris, France; Dr. William Bierman, Secretary, 471 Park Avenue, New York City, U.S.A.

The Sixth International Congress of Physical Medicine.—The Sixth International Congress of Physical Medicine will meet in London in May next from the 12th to the 16th of the month. This will be the first occasion upon which the Congress has met in Great Britain. The decision to meet in this country recognizes the high standing and achievements of treatment by physical methods in Great Britain and Ireland. Foreign members have expressed their cordial approval of this change from a Continental venue and their intention to assist by their presence and active participation in the discussions.

Lord Horder has accepted the office of President of the British Section of the Congress. Mr. Ernest A. Ebbelwhite, LL.D., is Hon. Treasurer; Sir Robert Stanton Woods, Chairman of the Executive Committee; Sir Henry Gauvain, Chairman of the General Committee; Dr. Albert Eidinow, Hon. Secretary; and Dr. Alexander Cawadias, Hon. Assistant Secretary.

Lord Horder will be supported by an influential body of Vice-Presidents and members of the Executive and General Committees of the British Branch, whose names are a guarantee of the widespread interest which is already being taken in the Congress by leading physiotherapists in this country.

Medical men who wish to attend the Congress are requested to communicate with the Hon. Secretary, Dr. Albert Eidinow, 4, Upper Wimpole Street, London, W.1. The Congress fee has been fixed at two guineas for each member.

The Royal Danish Serum Institute at Copenhagen will become an international clearing house for some of the serums used in treating or preventing disease, as a result of action taken by the eleventh Congress of Biological Standardization held in connection with the League of Nations Hygiene Congress. The Danish Institute has been appointed the international centre for preparation and standardization of serum for such diseases as dysentery, lockjaw, diphtheria, pneumonia, and wound fever.

London will similarly become the international centre for vitamins, insulin, and the sex hormones.

International standards for the preparation and composition of twenty-five of the medicaments to be distributed from Copenhagen and London have been agreed on by the Congress of Hygiene.

A New Belgium Stamp.—The Belgian postal authorities have announced that they intend to issue a special stamp in memory of Queen Astrid who was killed in a motor accident at Kuessnacht, near Lucerne, Switzerland, under most tragic circumstances.

It is announced that it will bear the portrait of the dead Queen and will be sold at a slightly higher price than the ordinary postage stamps of Belgium. This is only natural, but the human interest in the announcement lies in the statement that the money raised by the extra cost of the new stamp will be devoted to a national fund for the country's battle against tuberculosis.

Book Reviews

Failure of the Circulation. T. R. Harrison, M.D., Associate Professor of Medicine, Vanderbilt University School of Medicine, Nashville, Tenn. 396 pages, illustrated. Price \$4.50. Williams & Wilkins, Baltimore, 1935.

The author intimates that his book deals primarily with the "haemodynamics" of circulatory disease, based upon clinical study and animal experiment over a period of ten years. He has endeavoured to present not the purely clinical nor the purely physiological aspects of heart disease but a combination of biochemical, physiological and clinical viewpoints of one special phase of it, namely, congestive heart failure. A survey of the text indicates that with the fundamental concept of "haemodynamics" as the basis of circulatory function there is a worthy attempt to clarify the subject by utilizing, tentatively, three newly coined terms, "hyperkinetic", "hypokinetic", and "dyskinetic", as applied to syndromes that have been previously and loosely designated. For example, the *hyperkinetic syndrome* has been made to include the older terms, "over-active heart", "over-demonstrative heart", "soldier's heart", "effort syndrome", and "neuro-circulatory asthenia". The *hypokinetic syndrome* is inclusive of the older entities described as "primary shock", "secondary shock", and "collapse", or all the acute forms of circulatory failure regardless of causes. The *dyskinetic syndrome* includes disorders either associated with "congestive heart failure", or prone to lead to progressiveness of this malady.

The hypokinetic syndrome is described in considerable detail in relation to etiology, symptomatology and treatment. Etiologically, it is subdivided into vasogenic, cardiogenic, and unclassified types of acute circulatory failure. Some very pertinent suggestions are made as to carefully selected treatment and to the thoughtless use of digitalis. The hyperkinetic syndrome is characterized subjectively by *palpitation* in a regularly beating heart that is not immoderately rapid. The true cardiac dyspnoea of structural disease is not present. Measurement of the vital capacity is important in distinguishing organic from functional dyspnoea. It is diminished in the organic, and normal in the functional form. Nineteenth of the volume is given to the consideration of the dyskinetic syndrome of *congestive heart failure*, due to structural disease of the heart. The common causes include hypertension and arteriosclerosis, which account for two-thirds to three-fourths of all cases of cardiac disease. The less common causes are chronic pulmonary disease, hyperthyroidism, anaemia, con-

*Recommended by the
Medical profession*



for DISORDERS OF THE LIVER,
BLADDER AND KIDNEYS,
RHEUMATISM, ARTHRITIS



BOTTLED UNDER GOVERNMENT SUPERVISION AT THE SPRINGS

VICHY Célestins

Sales Agent: HERDT and CHARTON INC.
2027 McGill College Ave., Montreal 11 King Street W., Toronto

MEDICAL BOOKS

H. K. LEWIS & CO. LTD.

Medical Publishers & Booksellers

Large Stock of Text-Books and Recent Literature in all
Branches of Medicine and Surgery. Books Advertised or
Reviewed in this Journal Supplied Promptly on Request.

Periodicals supplied at Subscription Rates.

COLONIAL LIBRARIES, COLLEGES AND SIMILAR
INSTITUTIONS

Special facilities for executing Large Orders for Shipment to
all parts of the World.

SECOND-HAND BOOK DEPARTMENT,
140 GOWER STREET,

—Catalogues post free on application.—

Old and rare books sought for and
reported free of charge.

To Residents in Canada, South
Africa, Australia, etc.

Lewis's can supply
(Direct by First Mail)

The Publications of all Publishers.

Books sent by C.O.D. where facilities available

Any Book in General Literature not in Stock
Supplied to Order

LONDON:

H. K. Lewis & Co. Ltd., 136 Gower St., W.C.1

Surgeon Wanted

Outstanding opportunity for capable
surgeon experienced general practice, to
join private clinic in ideal locality.
Verified cash returns and extensive con-
nections offering great surgical scope to
responsible man, age 30-40. Send copies
testimonials and photograph. Reply Box
237, Canadian Medical Association Jour-
nal, 3640 University Street, Montreal.

MEDICAL ILLUSTRATOR

Late of McGill University; fully trained
and experienced; studied under Max Brodel,
Johns Hopkins. Can undertake all types of
illustrations.

Pauline Larivière

Pathological Institute,
Royal Victoria Hospital,
Montreal.

Classified Advertisements

SNOW SEDANS, by Fudge, Moosomin, Saskatchewan, are
proving the most satisfactory mode of winter transportation
for Doctors and others who have to travel irrespective of the
condition of the roads. After three years on the market, a
staff of twenty men are now employed in making these snow-
sedans. A full description with photograph and prices will be
mailed on request. R. J. Fudge.

PARTNERSHIP WANTED—Canadian M.D. with M.R.C.P.
(London) wants a partnership or assistantship in Canadian
city, to do Internal Medicine. Good recent experience in
English teaching hospitals. Apply Box 238, Canadian Medical
Association Journal, 3640 University Street, Montreal.

DIETITIAN desires position. Graduate Macdonald Institute
at Guelph and University of Toronto. One year pupil dietitian
work in Buffalo and Montreal hospitals. Temporarily in re-
sponsible charge 90 bed hospital. Excellent recommendations.
Ruth G. Barns, 581 Gilmour Street, Peterborough, Ontario.

FOR SALE—Used Victor Stabilized Office and Portable
X-Ray unit with timer and Coolidge tube. Operates on 110
volt, 60 cycle. Also a CDX Victor Dental X-Ray Unit. Both
in excellent condition. Prices reasonable. Box 236, Canadian
Medical Association Journal, 3640 University Street, Montreal.

FOR SALE—Medical practice and property, city in Niagara
Peninsula, Ontario. Established twelve years. Owner leaving
Province in about five months. Apply Box 239, Canadian
Medical Association Journal, 3640 University Street, Montreal.

WANTED—Vacancy for women interns in general hospital
for July 1st and September 1st, 1936. 100 beds, including surgi-
cal, medical, paediatric and obstetrical services; venereal and
mental clinics. Salary and maintenance. In the State of
Pennsylvania. Also vacancy for one intern immediately. Apply
Box 240, Canadian Medical Association Journal, 3640 University
Street, Montreal.

genital heart disease, and bacterial endocarditis. These constitute 10 per cent of the cases.

There is a short chapter on prognosis in cases with congestive failure, and a more lengthy chapter on the use of digitalis. Later chapters are devoted to mixed types of circulatory failure, such as the simultaneous occurrence of the hyperkinetic and dyskinetic syndromes, also of the hypokinetic and dyskinetic types, and, finally, twenty pages are devoted to the failure of the coronary circulation and the interpretation of cardiac pain. A concluding chapter summarizes the whole treatise as a convincing brief for the practice of assessing circulatory disorders in terms of "haemodynamics", the fundamental factor in which is "back-pressure", associated with *inefficiency* rather than *insufficiency* of the myocardium.

The writer of this review is free to acknowledge that he has a materially better conception of cardiology for having read Dr. Harrison's book. The general practitioner, as well as the cardiologist, will find it of considerable practical value.

Practical Clinical Psychiatry for Students and Practitioners. E. A. Strecker, A.M., Sc.D., M.D., Professor of Psychiatry, University of Pennsylvania, and P. G. Ebaugh, A.B., M.D., Professor of Psychiatry, University of Colorado. Fourth edition. 650 pages, illustrated. Price \$5.00. P. Blakiston's Son, Philadelphia, 1935.

This excellent volume may be strongly recommended; in the timeworn cliché it is a book which should be on the shelf of every student and practitioner. Though ostensibly for those outside the specialty, there is in it much food for thought, even for the practising psychiatrist. To a large extent the book is an exposition of the views of Adolf Meyer, to whom it is inscribed. The outstanding merits are two-fold—first the breadth and tolerance of the viewpoint of the authors, and, secondly, the utilization of the case record as the basis for all statements. It is indeed refreshing to see the strictly practical attitude, so forcibly expressed and, even more important, the effort to adduce objective material in support of the expressed view. Psychiatry has suffered too long under the handicap of fantastic formulations presented with the flimsiest evidential support.

The style throughout is in general clear and forceful, though at times somewhat stilted and ponderous; such terms as "environmental constellation", "genetic dynamic view", etc., could with advantage be simplified. Amongst many excellent features the outline of psychiatric examination stands out, as does the handling of the organic reaction types. Using Swift's "struldbug" as the prototype of the senile psychoses is a pleasing touch. Particularly striking is the breadth and almost humorous tolerance expressed throughout. No one approach, psychoanalytical, physiological, or biochemical, is neglected or over-stressed. Minor criticisms as to the presentation of various disputable points could, of course, be made, but these in no way detract from the very real value of this publication.

Arthritis and Rheumatoid Conditions. Ralph Pemberton, M.D., F.A.C.P., Professor of Medicine, Graduate School of Medicine, University of Pennsylvania. Second edition, 455 pages, illustrated. Price \$5.50. Lea & Febiger, Phila., 1935.

The first edition of this work was published in 1929 and is now thoroughly revised. The author is well qualified to write on the subject of arthritis and has combined his own observations with other investigators of this condition.

The first five chapters are utilized for a description of the disease. Chapters six and seven describe the treatment, and every method is thoroughly discussed. The importance of treatment is emphasized by the fact that fifty additional pages have been given over to "the treatment" since the publication of the first edition. One of the most interesting and

valuable chapters is number ten, where the results of treatment are discussed and tabulated.

The book is well printed and has some 69 engravings, one coloured plate, and an excellent index. In the opinion of the reviewer this is one of the most valuable additions to the study of arthritis and rheumatoid conditions.

Hæmochromatosis. J. H. Sheldon, M.D., F.R.C.P. Honorary Physician to the Royal Hospital, Wolverhampton, etc. 382 pages, illustrated. Price \$7.50. Oxford University Press, London; McAlinsh, Toronto, 1935.

In November, 1934, Dr. Sheldon delivered the Bradshaw Lecture before the Royal College of Physicians on the subject which forms the title of this book. He has gone to a great deal of trouble to hunt up in journals which were published before indexing was common references to this comparatively rare condition, and has thus compiled a most complete bibliography which will merit the thanks of future students.

Most monographs on medical subjects are ponderous and full of dull statistics but this work is written in such a delightful style and has so many personal touches that the reader wants to follow the research work to the end of the 382 pages. It seems strange that only 311 cases are reported in the literature, because every large hospital service comes in contact with these patients, particularly in the diabetic clinic. The evidence which the author produces, however, comes largely from the pathological department, and shows that the annual incidence of the disease varies greatly.

A disease of middle-aged males (only 13 females reported), hæmochromatosis is characterized by pigmentation of the skin in 83 per cent of cases. This varies a great deal in colour, distribution and intensity, particularly if the diabetes, present in 78 per cent of the cases, is adequately controlled by insulin. The theories of the underlying cause are many but none of them are entirely satisfactory. Sheldon weighs the arguments judiciously and concludes that hæmochromatosis is an inborn error of metabolism.

This book is a remarkable example of how research work can be made interesting to the general practitioner, who, after all, is the man who uses facts obtained in the laboratory to lessen the sum total of human suffering.

Sir Donald MacAlister of Tarbert. By his wife. VII and 392 pages, frontispiece. Price 12/6. Macmillan, London, 1935.

Biographies are common just now, but none should be more acceptable than this. Doubtless, few on this side of the water have had the advantage of a personal contact with the subject of this sketch, but many of those interested in medical progress and academic work are familiar with his career, and will welcome this opportunity to learn more about the man and his achievement.

We are told that Donald MacAlister was the scion of an old and formerly wealthy Scottish family, the MacAlisters of Tarbert; in fact, descended from the Chief. Losing their possessions as a result of clan warfare, the family fell upon evil days, and a hundred or more years ago their head was a poor crofter and fisherman. Nevertheless, his grandson was to become Sir Donald MacAlister and a remarkable figure in our time. The future Sir Donald was born on May 17, 1854, and early in life evinced those qualities which make for success in life. He won many prizes, bursaries and exhibitions at school and college by which he made himself self-supporting from childhood. He had the opportunity of going either to Oxford or Cambridge, and, as he was equally distinguished in classics and mathematics, he found it difficult to make a choice. We are told he "tossed up and it came down heads for Cambridge".

Acute and Generalized Staphylococcal Infections

Staphylococcus Antitoxin

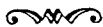
From various sources there has been an accumulation of evidence which suggests that much of the symptomatology of acute staphylococcal infections is attributable to liberation of staphylococcus exotoxin within the body. The serious nature of such infections would appear to be due in large measure to the highly pathogenic effects of staphylococcus exotoxin upon living cells and tissues. Consequently, the use of staphylococcus antitoxin has been advocated in the treatment of acute and of generalized infections where there is evidence that *Staphylococcus pyogenes* is the causal micro-organism. (See the issues of this Journal for June, July and August, 1934.)

As prepared by methods evolved in the Connaught Laboratories, *Staphylococcus Antitoxin* consists of refined and concentrated globulins from the blood-serum of horses which have been immunized against pooled toxoids and toxins of several selected strains of staphylococcus. Beneficial results have followed administration of this antitoxin in ACUTE CARBUNCLE and in CELLULITIS, OSTEOMYELITIS, MENINGITIS and SEPTICAEMIA, where staphylococcus has been the infecting agent.

Staphylococcus Antitoxin (Refined and Concentrated) is available from the Connaught Laboratories in 5,000-unit and 10,000-unit vial-packages.



*Prices and information relating to
the use of Staphylococcus Antitoxin
will be supplied gladly upon request.*



CONNAUGHT LABORATORIES
University of Toronto

TORONTO 5

CANADA

Accordingly, he went to the latter and never regretted his decision. Ever after, Cambridge was strong in his affection. MacAlister was so versatile, and, withal, so outstanding, that it, no doubt, was with some little hesitation that he made a decision as to what his life's work should be. In 1872 he was already a marked man, for when receiving a number of prizes at the Liverpool Institute from the hands of Sir John Duke Coleridge, afterwards Lord Chief Justice, he was advised by that luminary to enter the legal profession. But by this time his mind seems to have been made up to become a medical man. The legal fraternity, doubtless, lost one who would have gone far, as he went far in his chosen line. He became senior wrangler in the mathematical tripos in 1877. He then entered St. Bartholomew's Hospital Medical School and qualified in medicine, returning to Cambridge to become Fellow and Tutor at his old college, St. John's, assistant to Sir George Paget, Regius Professor of Physic and physician to Addenbrooke's Hospital. He was early elected to fellowship in the Royal College of Physicians of London. He studied physiology at Leipzig under Karl Ludwig and made a mark by his Goulstonian and Croonian lectures and by his remarkable translation of Ziegler's Pathological Anatomy.

In 1904 MacAlister became president of the General Medical Council, which office he held for twenty-seven years. His work for medical education and ideals is described in the book by his successor, Sir Norman Walker. In 1907 he accepted the principalship of Glasgow University. The story of what he effected in that connection is told by Sir Robert Rait, the present principal. He was a model principal and when he retired, to the regret of all, he received the signal honour, in 1930, of being elected Chancellor of the University. He died on January 15, 1934.

Governments and learned bodies seemed to vie with one another to do him honour. He was K.C.B. and a baronet; he was a Grand Officer of the Legion of Honour; Justice of the Peace and Deputy Lieutenant for the county of the city of Glasgow; a Freeman of Glasgow; and honorary member of many learned societies. He held fourteen degrees, honorary and otherwise, and is said to have equalled the Earl of Balfour in the number of these distinctions, as given in "Who's Who". These two were easily *facile principes* in this particular, as in others. As a scholar, linguist (he could speak about twenty languages), organizer, and man of affairs Sir Donald MacAlister was equally eminent. In this biography we have from the deft and loving pen of his widow a moving account of the life, work, and character of a truly great figure. We note his sterling goodness and his simple religious faith; we note his brave struggle against almost constant ill-health; we note an achievement but rarely paralleled in the life of any other man. We feel that the story is not distorted or embellished by affection, but is truthfully told. We lay the book down with admiration for a noble character, but also with a sense of humility when we think of the comparative futility of the work of the rest of us.

Methods of Treatment. L. Clendenning, Clinical Professor of Medicine, University of Kansas. Fifth edition, 879 pages, illustrated. Price \$11.50. C. V. Mosby Co., St. Louis; MacAinsh, Toronto, 1935.

The fifth edition of Dr. Clendenning's "Methods of Treatment" is worthy of its famous predecessors. It starts out with the avowed ambition "to bring into one volume all therapeutic procedure". This object is achieved in a little less than 900 pages; every feature of treatment from the mysticism of prescription writing to the technique of psycho-analysis is referred to. The book has an excellent general tone; a philosophical humour frequently shows itself; a cheerful and sanguine attitude is apparent in the author; a broad outlook on life and a good knowledge of medical history and literature are manifest.

Except for ten short articles on highly specialized subjects the whole work is by Dr. Clendenning himself. For a single individual to cover so broad a field faultlessly is quite impossible. The attempt is a tribute to the courage and industry of the author. The inevitable result is that there are some obvious "soft spots" to be discovered. One could enumerate a good many points in which the author is not in line with ideas that are now current. For example, the indications for pneumothorax treatment in pulmonary tuberculosis would not be subscribed to by most present-day tuberculosis workers. There are other sections also which would be improved with thorough revision. The book contains accounts of a number of methods of treatment that might well be forgotten. Does Dr. Clendenning ever prescribe "the affusion" as pictured on page three hundred and eighty-eight? Surely his sense of humour would deter him! This sort of dead wood clings tenaciously to textbooks.

In spite of some other minor criticism that might be made the book is an excellent textbook, arranged in a logical way and written in a pleasant style.

The Special Procedures in Diagnosis and Treatment. Don Carlos Hines, M.D., Clinical Instructor in Medicine, Stanford University. 66 pages. Price \$1.00. Stanford University Press, California, 1935.

One always looks on small clinical handbooks with the hope of finding therein methods and practical tips which larger works are apt to overlook. We may say at once that the handbook under review is not notable. It does not pretend to be exhaustive, but somehow one wants a little more than it gives, as well as less. The historical notes might have been dispensed with, and more rigorous editing could compress the material. A large amount of clinical guidance can be packed into a very small space if one knows how. Apart from this, there are useful notes on every day clinical procedures.

Prognosis. Vol. I. 372 pages. Price 10/6 net. Published by *The Lancet, Ltd.*, London, 1935.

Our readers are doubtless familiar with the volumes "Modern Technique in Treatment" and "Clinical Interpretation of Aids to Diagnosis", collections of articles, specially written for *The Lancet*. The volume "Prognosis" is issued as the first group of a series of articles on the subject, now appearing in that Journal. It is not a complete textbook on the subject, but a collection of some 60 short monographs of three to five pages, rarely more, written by men with special experience. The diseases chosen for inclusion in the series are not only the commoner ones met with in practice but include a number of rarer ones concerning which the practitioner will be glad to have the advice of men of wider experience. Until the series is complete it will not be a reference book in the usual sense, but a book which any physician may read with profit—short articles which may be mastered in spare moments. No special system of selection appears to have been followed, but the diseases under discussion are arranged in groups.

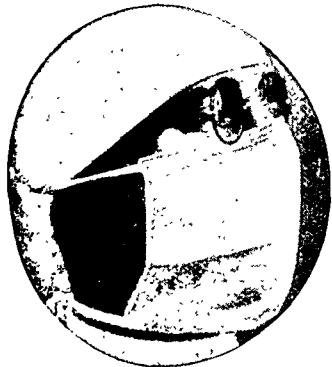
A Guide to Human Parasitology. D. B. Blacklock, M.D., D.P.H., D.T.M., Professor of Tropical Hygiene, Liverpool School of Tropical Medicine, and T. Southwell, D.Sc., Ph.D., A.R.C.Sc., F.Z.S., F.R.S.E., Walter Myers Lecturer in Parasitology, School of Tropical Medicine, The University, Liverpool. 260 pages, illustrated. Price 12s. 6d. net. H. K. Lewis, London, 1935.

To those familiar with the first edition this volume needs no introduction. This outstanding work, a unique production, richly deserves praise. The text is clear and concise and its able presentation indicates the author's extensive experience in the field of parasitology. The book is intended for practitioners and for students of Tropical Medicine, Tropical Hygiene and Public Health. Stress has been laid on the pathogenic organisms and

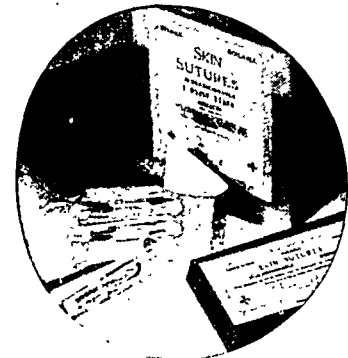
Feb. 1936]

**Operating Room Caps**

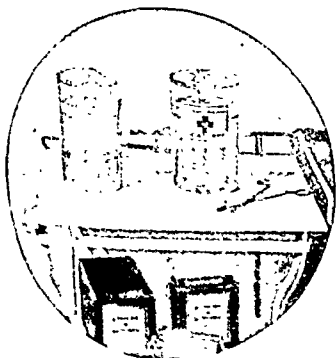
Bleached, sterilizable strong cloth, shaped to conform to head contour when tied behind with the tapes.

**Nose and Mouth Masks**

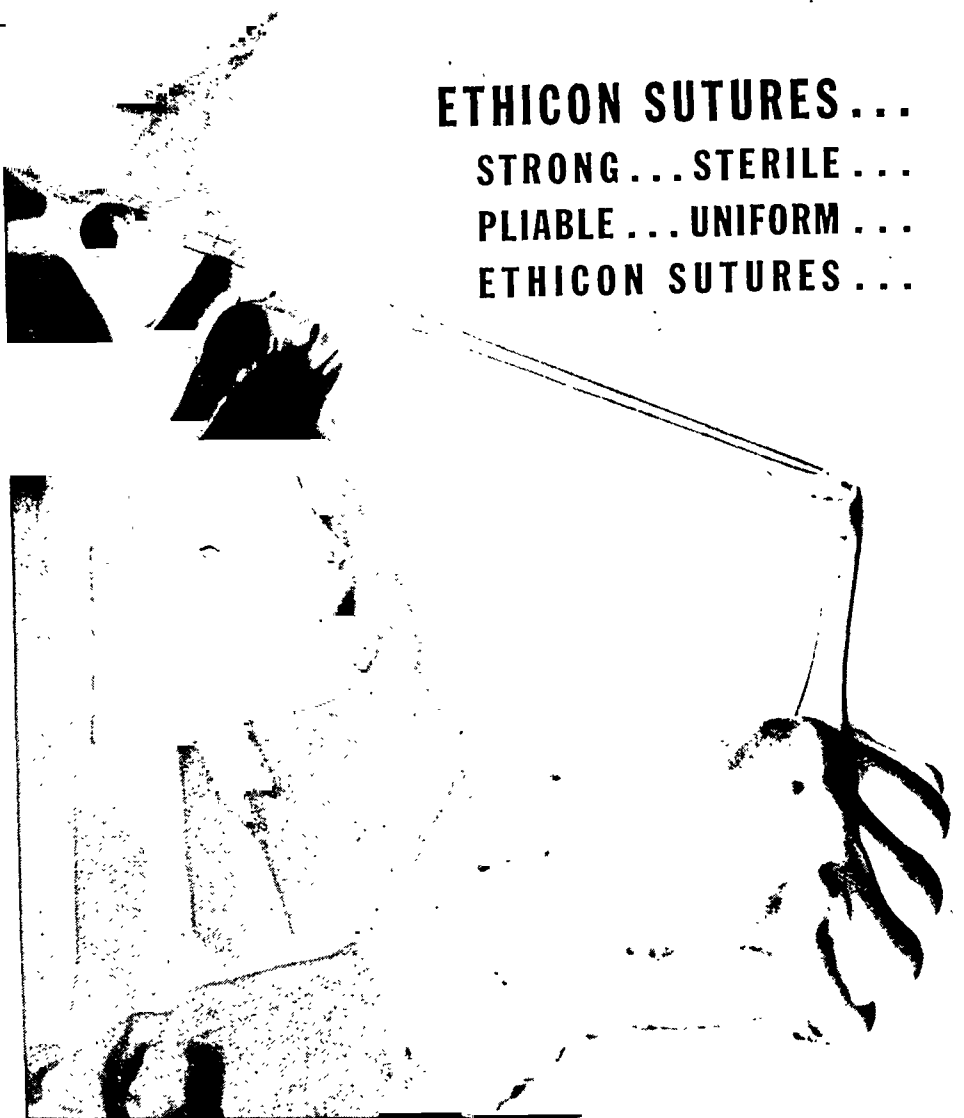
4-ply Surgical Gauze. Flexible aluminum nose bridge permits close fitting, eliminating cloudy glasses.

**Skin Sutures**

Pliable, non-absorbable, dyed green, color-fast. Fine, medium, coarse.

**Ligature Storing Jars**

Keep tubes completely immersed. Four compartments for orderly storing of the ligatures.

**ETHICON SUTURES...****STRONG...STERILE...****PLIABLE...UNIFORM...****ETHICON SUTURES...**

● Ethicon Non-Boilable Catgut Sutures are produced in our own special laboratory in the packing house district of Chicago, where each day's supply of sheep's intestines is delivered to us fresh and in prime condition. The Johnson & Johnson suture laboratory is the only one especially located and built for the purpose. Every step of manufacture is carried out under strict laboratory conditions, from the receipt of the fresh intestines until the finished suture material is sent to our laboratories in New Brunswick for testing, tubing and sterilization. Ethicon Sutures are unusually strong and extremely pliable, uniform in size and heat-sterilized. They are ready to use upon breaking the tube—they require no soaking or other conditioning.

ETHICON SUTURES

Let us send you a trial supply—without obligation. Specify size and type desired. Sizes: 000; 00; 0; 1; 2; 3. Plain; medium hard chromic; extra hard chromic.

HOSPITAL DIVISION

Johnson & Johnson Limited
MONTREAL CANADA

The facts behind the phrase

"We furnish no formulæ to the laity."
You've seen those words in many advertisements. You have read them with approval—as you should, for the function of prescribing the correct formula for a baby's individual needs should in every case be left entirely to the physician.

But the makers of Borden's St. Charles Evaporated Milk go even further.

We believe that the FORM of milk, as well as the formula, should be left to the doctor to decide. We do not promote our evaporated milk to the general public for use in infant feeding, nor do we make extravagant claims as to its value. The wide acceptance of Borden's St. Charles Evaporated Milk in formula feeding is entirely the result of the approval and recommendation of the medical profession. This is . . . and

always has been . . . the policy in accordance with which the makers of Borden's St. Charles Evaporated Milk furnish the babies of Canada with the clean, pure milk that is their birthright.

For it is our sincere belief that any less wholehearted co-operation with the medical profession would run counter to the best interests of all who are concerned in the important business of baby feeding.

Borden's Evaporated Milk was accepted in 1930 by the American Medical Association Committee on Foods.

The Vitamin D content of Borden's St. Charles Evaporated Milk has been increased by direct irradiation with ultra-violet rays under Canadian Patents Nos. 291,138 and 306,562. Licensed by Wisconsin Alumni Research Foundation.



Borden's IRRADIATED
ST. CHARLES EVAPORATED MILK

MADE IN CANADA



Prolonged Antiseptic Action in the Urinary Tract



ARHEOL
(Astier)

In acute inflammation of the bladder, posterior urethra, and genito-urinary tract—where there is pain, tenesmus, and frequent urination—one of the best internal medication adjuvants is the active principle of sandalwood oil—*santalol*.

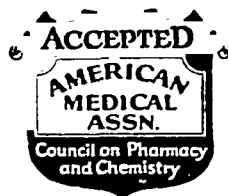
By charging the urine with santalol, the entire mucosa of the bladder and posterior urethra is constantly being laved with a soothing, reducing, and antiseptic fluid.

This is exactly what takes place when you administer ARHEOL (Astier).

For Arheol (Astier) is the purified active principle of sandalwood oil, containing never less than 98% of santalol. It is free of the therapeutically inert but irritating substances found in crude sandalwood oil.

In the acute stage of *Gonorrhea*, Arheol (Astier) alleviates pain, reduces inflamma-

tion, lessens involvement of the posterior urethra, diminishes the frequency of urination. When local treatment is indicated, it acts as a useful adjuvant to treatment with local antiseptics and astringents. It may be used to advantage in *Cystitis*, *Vesical Catarrh*, *Prostatitis*, *Posterior Urethritis*. In *Pyelitis* and *Pyelonephritis*, owing to its dependable urinary antiseptic properties, Arheol (Astier) is a definite aid in overcoming infection in the kidney and renal pelvis.



Send for Literature and Sample

Agents for Ontario, the Western and Maritime
Provinces:

JOHN A. HUSTON COMPANY, LTD.
36-48 Caledonia Road - Toronto

Agents for the Province of Quebec:

ROUGIER FRÈRES
350 LeMoyne Street - Montreal

CONICAL HEADS

for INTERNATIONAL CENTRIFUGES

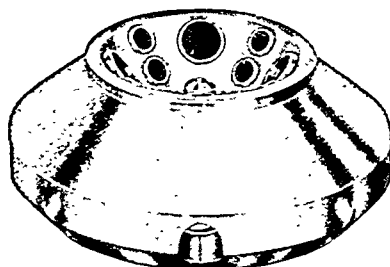
- Streamlined for High Speed.
- Sloping Sedimentation Principle.
- Greater Number of Tubes.
- Light Weight and Strong.
- Designed to take Standard Glassware.
- Interchangeable with other regular International Heads.



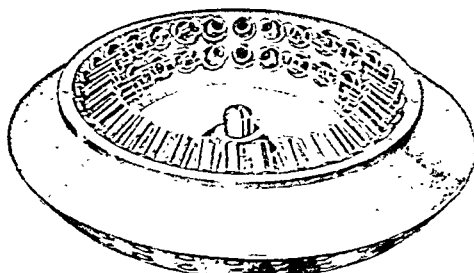
Conical Heads No. 813 and No. 838 are shown at right.

There is a Conical Head for every model International Centrifuge—a wide variety of types, all affording easy manipulation of tubes and rapid sedimentation.

SEND FOR NEW BULLETINS



12 place comb.—15 and 50 ml.



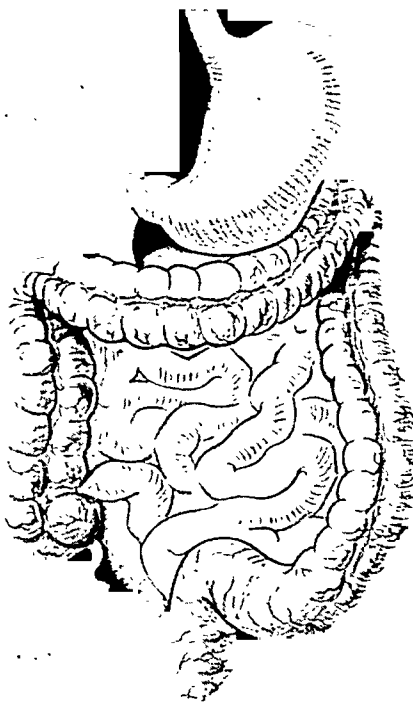
10 ml. tube head

INTERNATIONAL EQUIPMENT COMPANY

352 Western Avenue

Makers of Fine Centrifuges

Boston, Mass., U.S.A.



APERIENT SALINES

do not interfere

WITH DIGESTIVE JUICES

● Complete evacuation of the colon without interference with digestion in the small intestine is the distinctive quality exhibited by the laxative salines. For this purpose they are superior to many vegetable purgatives, since they do not accelerate the passage of chyme through the small intestine and thus diminish digestion by the pancreatic and intestinal juices.

Sal Hepatica closely approximates, in its components and their ratio, the most famous natural aperient waters, both here and abroad. It combats acidity and promotes a feeling of well-being, and its sparkling effervescence makes it a pleasant-tasting eliminant.

We'll be pleased to send clinical samples for trial of this safe, prompt-action laxative and purgative.

**SAL HEPATICA CLEANS THE INTESTINAL
TRACT AND COMBATS ACIDITY**

COUPON

Please send clinical
supply and literature
on SAL HEPATICA.

BRISTOL-MYERS COMPANY

1241-C BENOIT ST., MONTREAL, CAN.

_____ M. D.

Street _____

City _____ Prov. _____

*For rational,
effective
vitamin E
therapy—*

VitEol

*A vitamin E concentrate
derived from Wheat Germ*

A product of proven value in the control of habitual
and threatened abortions.

VitEol is prepared according to the method used in
The Dept. of Experimental Medicine,
University of Western Ontario.

And is supplied in packages of one hundred capsules
of 15 minims each,

Literature will be gladly sent upon request.

THE CANADA PHARMACAL COMPANY, LTD.

LONDON, ONTARIO

CORAMINE "CIBA"

Circulatory and Respiratory Stimulant

Coramine is a 25% solution of pyridine-b-carboxydiethylamide.
By a direct influence on the centre, it acts as a most efficient respiratory stimulant; increasing both the depth and the rate of respiration.

Coramine stimulates the heart, leading to an increase in the output of blood; at the same time, it tends to cause vascular relaxation, so that, with or without a rise in the blood-pressure, the rate and efficiency of the circulation are improved.

AMPOULES - LIQUID

CIBA
COMPANY
Limited
MONTREAL

Throat Infections

In conjunction with your more specific measures, we suggest a frequent gargle of equal parts LAVORIS and hot water.

You can depend upon LAVORIS for a freer removal of viscid accumulations and a maximum reduction of organisms. In addition it has a decidedly beneficial and comforting effect upon inflamed tonsils and membranes.

Sample
on
request

LAVORIS

Made in Canada by

LAVORIS CHEMICAL COMPANY LIMITED
92 Jarvis Street, Toronto, Ontario

precise **ACCURACY**
with **Portability**

and these exclusive features:

- Calibration 260 or 300 mm.
- Size 1½" x 3¼" x 11¼".
- Weight 30 ounces.
- Inflation system self-contained.
- Cast Duralumin Case.
- Manometer encased in metal.
- Nameplate cast in cover.
- Air-Flo Control.
- Individually calibrated Pyrex glass tube.
- Steel reservoir.
- Unobstructed legible scale.
- Lifetime guarantee against glass breakage.
- Perpetual guarantee for accuracy.
- Price \$29.50.

KOMPAK
MODEL
SMALLEST
LIGHTEST
HANDIEST

Lifetime
Baumanometer
STANDARD FOR BLOODPRESSURE

W. A. BAUM CO. Inc. NEW YORK
SINCE 1916 ORIGINATORS AND MAKERS OF
BLOODPRESSURE APPARATUS EXCLUSIVELY

DR COLLECTEM

Several months ago we advertised—

A RECORD BREAKER!

Last month, The Medical Audit Association brought in **MORE MONEY** to the physicians, dentists and hospitals of Canada than in any one month during the preceding four years!

And the following month's receipts were higher still.
Isn't it time to convert YOUR past-dues into cash?

Mail us your list To-Day, Doctor!

THE MEDICAL AUDIT ASSOCIATION
44 VICTORIA STREET, TORONTO

VI-TONE

The Delicious Nourishing Food Beverage—

Provides well-balanced nourishment, *complete* proteins adequate for promoting normal growth of children, easily digested carbohydrates, calcium, phosphorus, iron and the growth promoting vitamins B and G and it is an *alkali-forming* food.



Children like Vi-Tone as a beverage at meals or between meals and as a paste spread on bread and butter or biscuits.

VI-TONE COMPANY
HAMILTON - - CANADA

for G. U. Work

B-D ASEPTO SYRINGE

No. 2030 . . $\frac{1}{8}$ oz.
 No. 2040 . . $\frac{1}{4}$ oz.
 No. 2050 . . $\frac{1}{2}$ oz.
 No. 2060 . . 1 oz.



REMOVABLE BAKELITE PLUG
 hinders entrance of fluid into bulb
 and provides large hole for cleaning
 bulb, when removed.

Short, reinforced
 bulb neck for easy
 bulb insertion and
 removal.

Gentle one-hand control.

Exactly fitted bulb
 eliminates backflow.

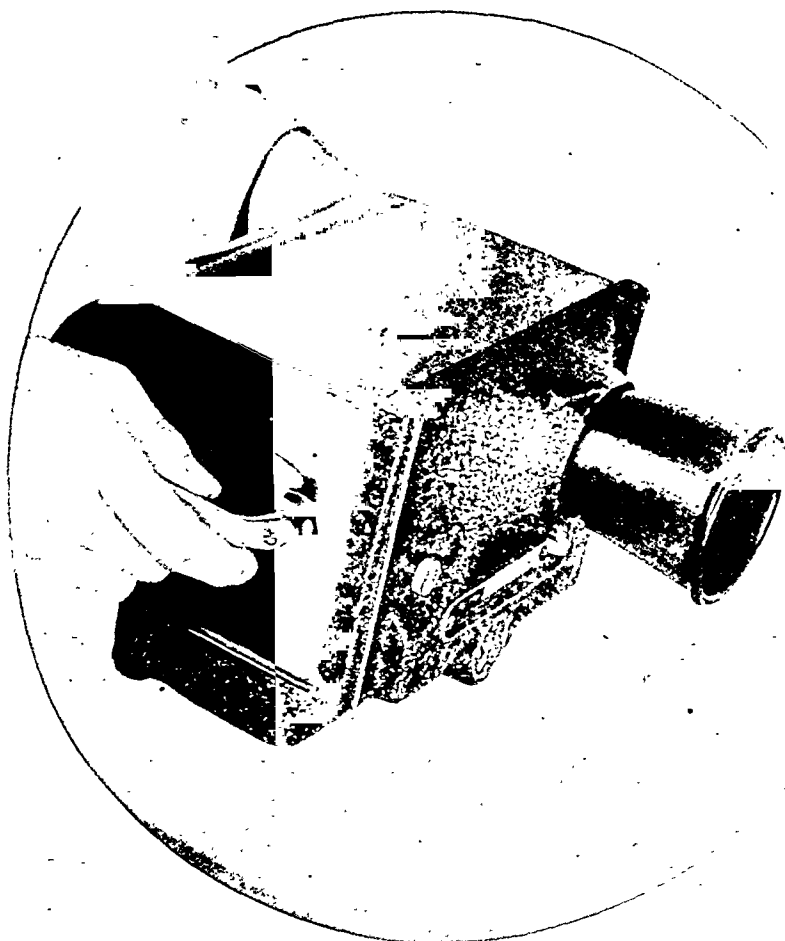
Smooth, anatomically
 correct tips.

Durable, annealed,
 heat-resisting barrels.

A SEPTO syringes are also available in Patient Outfits which may be carried inconspicuously and facilitate safe and sanitary administration of the prescribed medication. These are shown in a folder describing and illustrating 50 styles and sizes of Asepto syringes for various uses. A copy will gladly be sent on request.

B-D PRODUCTS
Made for the Profession

BECTON, DICKINSON & CO., RUTHERFORD, N.J.



**DON'T JUDGE THE
RANGE OF THIS
OFFICE-PORTABLE
X-RAY UNIT BY
ITS SIZE**

BECAUSE the G-E Model "F" Office-Portable X-Ray Unit seems to you so extremely small in size, and its low price places it easily within your means, don't make the mistake of overlooking its practical diagnostic range and ability to produce radiographs of fine quality.

The principle of *complete* oil-immersion of both the high-voltage transformer and the x-ray tube in a single, sealed container accounts for this unusual compactness and high efficiency. Moreover, it makes the outfit absolutely shock proof under all operating conditions.

If you have not yet taken the opportunity to see a practical working demonstration of the Model "F" in your own office, you cannot fully appreciate its possible advantages in your practice.

Fill out and mail this coupon requesting a demonstration. You need not feel obligated in so doing.

☐ Please arrange for an office demonstration of Model "F" Office-Portable X-Ray Unit.

☐ Send literature describing the Model "F" Unit.

A62

Dr.

Address.....

City..... Prov.



In the office or in the patient's home, this unit is practical, convenient and efficient.

VICTOR X-RAY CORPORATION



of Canada, Ltd.



Distributors for General Electric X-Ray Corporation - TORONTO-30 Bloor St., West - MONTREAL-5
Medical Arts Bldg. - VANCOUVER-Motor Transportation Bldg., 570 Dunsmuir St.
WINNIPEG-Medical Arts Bldg.

An important contribution to vitamin therapy . . .

NAVITOL SQUIBB NATURAL VITAMIN OIL

GOOD GENERAL RESISTANCE and firm bone structure are dependent in part upon an adequate supply of Vitamins A and D. Navitol—a new Squibb Vitamin Product—supplies these factors effectively and inexpensively.

The vitamins in Navitol are obtained from *natural* fish liver oil sources. Navitol is as rich in Vitamins A and D as halibut liver oil with-viosterol and yet costs 40 per cent less. It is convenient to use and effective in small volume dosage. The oil contains per gram not less than 50,000 Vitamin A units, and 10,000 Vitamin D units. Ten drops (or one 3-minim capsule) supply 8500 Vitamin A and 1700 Vitamin D units, *International Units*.



Navitol is available as follows:

5-cc. bottle of oil (with dropper).....	\$.75
Box of 25 gelatin capsules.....	.85

For further information write
Professional Service Department
36 Caledonia Road, Toronto, Ont.

E. R. SQUIBB & SONS of CANADA LTD.
Manufacturing Chemists to the Medical Profession Since 1858

LIBBY'S HOMOGENIZED FOODS—INCLUDED IN REGULAR DIONNE QUINTUPLETS' DIET



Photograph Copyright, Star Newspaper Service

Camera shows solid foods yield more nutriment when they are Homogenized

● No single vegetable or fruit yields ALL minerals and vitamins necessary for health and growth. As a result of research by child specialists, Libby's Homogenized Foods have been created to give a properly balanced blend of essential food elements, including vitamins.

A complete solid food diet is available in six tins comprising three formulated vegetable combinations, cereal, fruit combination, and soup. By Libby's special homogenization process all these foods have been rendered more completely digestible than the finest strained foods. Homogenizing breaks up the cellulose wall surrounding the food cells, reduces coarse fibres to tiny particles. These foods are so fine and smooth they may be fed from the infant's bottle through the nipple. Many babies are receiving the benefits of Libby's Homogenized Foods as early as three months, and these foods are exceptionally palatable.

Libby's Homogenized Foods provide a balanced blend of needed minerals and vitamins in the diet and make the solid foods available to the infant weeks earlier.

Pediatricians are invited to write Libby, McNeill & Libby Laboratories, Chatham, Ontario, for a series of bulletins which summarize the research on infant feeding that Libby has conducted. Also for samples of Libby's complete line of Homogenized Foods.

LIBBY, McNEILL & LIBBY OF CANADA, LIMITED
Chatham - - - - - Ontario

Study these Differences in Food Preparation



Home-strained vegetables after 2 hours' exposure to human digestive juices. Notice whole food cells still undigested. When undigested cells pass into the large intestine there is danger of fermentation—danger of diarrhea.



Commercial-strained vegetables after 2 hours' digestion. Here, too, the food is largely undigested. Needed nourishment has not been released—and intestinal disturbances may be caused by fermentation in the large intestine.



Libby's Homogenized Vegetables after only 30 minutes' digestion. Food cells have released all their nourishment! Baby gets all of it for health. Homogenized foods digest quickly and completely. No half-digested food passes into large intestine to ferment.

Libby's Baby Foods in 6 balanced combinations:

- 1 Peas, beets, asparagus tips
- 2 String beans, pumpkin, tomatoes
- 3 Carrots, spinach, peas
- 4 Cereal Combination . . . whole milk, whole wheat, soy bean flour
- 5 Prunes, pineapple juice, lemon juice
- 6 Soup—vegetables, chicken livers, barley



Libby's
Made in Canada

**Homogenized
FOODS FOR BABIES**

UNSEASONED EXCEPT FOR SALT • PACKED IN ENAMEL-LINED TINS

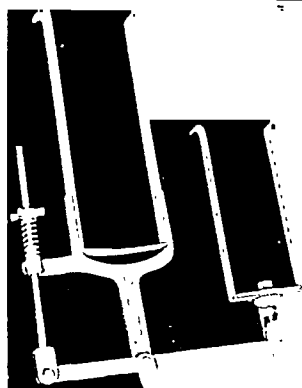


When Visiting London

buyers should make a point of calling at British Industries House, where all the most modern British medical equipment may be examined in comfort under one roof. Whether it is Hospital, Medical, Pharmaceutical or Ophthalmic apparatus that is required, it will be possible to get estimates and tenders at competitive prices, in the minimum time and without unnecessary travelling expense. Visits should be made and enquiries sent to

BRITISH INDUSTRIES HOUSE

MARBLE ARCH . . LONDON . . ENGLAND



Roger Anderson Well-Leg Splint

Wheel-chair Method of Treating Fractures of the Hip, Shaft of Femur and Pelvis

(See Page 625 June issue)

\$38.50

F.O.B. Seattle

THE TOWER COMPANY, Inc.

1121 Post Street - SEATTLE, WASHINGTON

Also manufacturer Ought-O-Matic Frax-Sure Splints for the treatment of the majority of upper and lower extremity fractures.

WOOD SANATORIUM

FOR THE TREATMENT
OF ADDICTION TO ALCOHOL

The treatment administered by Wood Sanatorium, opened 1931, establishes systemic incompatability with alcohol, builds up and regulates organic functions and renders patients free from all desire for alcoholic stimulant.

Wood Sanatorium is regularly registered and inspected by Departments of Health. All treatment under strict medical supervision, and nursing attendance. Complete facilities and commodious accommodations.

Medical practitioners are requested to make personal investigation and enquiry. Complete information freely given.

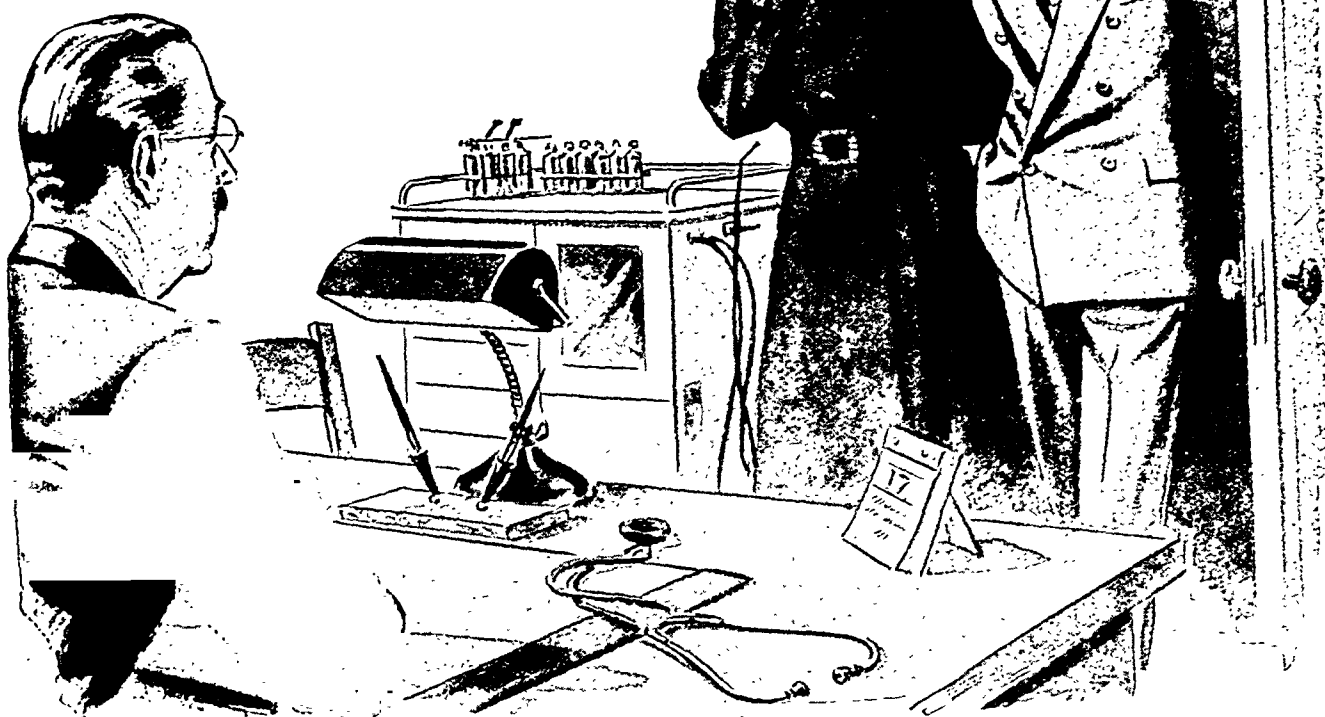
GEO. R. WOOD, Phm.C.
Superintendent

THE CLAREMONT
121 Emerald Street South
Hamilton, Ont.

and
J. T. WOOD, Phm.C.
Superintendent
47 Cornish Avenue
Winnipeg, Man.



Every doctor knows this family

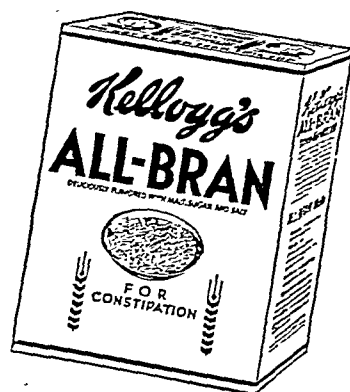


THEY visit you off and on. They're not actually sick, but never quite well. They lack the vitality they should have. Compared with others you know, their personalities seem colorless. Your questioning frequently reveals common constipation, due in most cases to insufficient "bulk" in their meals.

Addition of "bulk" to the diet is often indicated. But tests have shown that, with some individuals, the "bulk" in fruits and vegetables is largely broken down in the alimentary tract. This does not happen with bran.

Kellogg's ALL-BRAN provides an abundance of mild "bulk." Also vitamin B and iron. It may be served as a cereal, or made into appetizing muffins, breads, waffles, etc.

Kellogg's ALL-BRAN is much more effective than part-bran products. Recommend its use wherever advisable. ALL-BRAN is sold by all grocers. Made by Kellogg in London, Ontario.



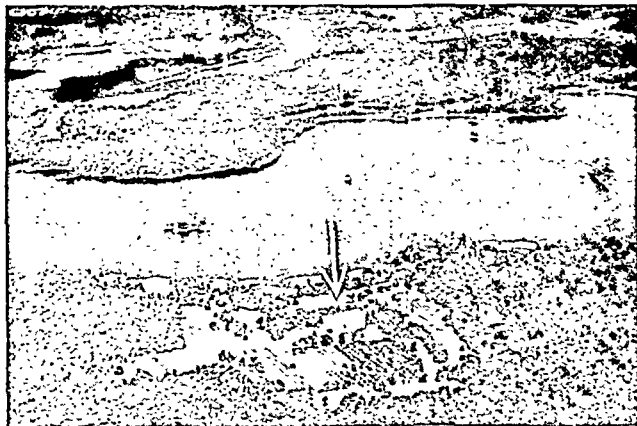
The natural food that corrects constipation

NEW ENGLAND SANITARIUM

(MELROSE P.O.) STONEHAM, MASS.

Ideal location on the shores of large lake, eight miles from Boston, in midst of 4,500 acre State Park. Overnight from nearly all points in Eastern Canada. Reasonable rates.

One hundred forty Pleasant, Home-like Rooms. Six resident Physicians, Seventy Trained Nurses. Experienced Dietitians and Technicians.



Aerial View—Arrow denotes buildings and 40 acres of spacious grounds



Main entrance

Scientific Equipment for Hydrotherapy, Electrotherapy and X-Ray, Occupational Therapy, Gymnasium, Golf, Solarium. Full health examinations and careful diagnosis. No Mental, Tubercular or Contagious diseases received. Physicians are invited to visit the institution. Ethical co-operation. Member American Hospital Association.

For booklet C and detailed information address:
W. A. RUBLE, M.D., L.R.C.P., L.R.C.S. (Edin.)
Medical Director

THE BURGESS PAVILION VERDUN PROTESTANT HOSPITAL

Verdun, Montreal, Que.

A private sanitarium for the treatment of diseases of the nervous system. Selected cases of alcoholism and drug addiction are also received. Amid quiet country surroundings with spacious grounds it is only fifteen minutes from the centre of Montreal. Modern in construction with hydrotherapeutic and electrotherapeutic equipment.



*For information as to rates, etc.
address:*

Dr. C. A. Porteous
P. O. Box 4019, Montreal, Que.

THE MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH

Rochester, Minnesota

(A Department of the Graduate School of the University of Minnesota) offers the following opportunities for graduate study:

1. *Fellowship in basic medical sciences* (biophysics, physiologic chemistry, physiology, bacteriology, pathology). Open to properly qualified graduates of colleges and scientific schools. Residence two to three years. Stipends \$840, \$900, and \$960 for the first, second, and third years, respectively.

2. *Fellowships in clinical branches* (internal medicine, neurology and psychiatry, dermatology, pediatrics, radiology, surgery, orthopedic surgery, neurosurgery, urology, obstetrics and gynecology, proctology, otolaryngology and rhinology, ophthalmology, and anesthesia). Open to graduates of approved medical colleges with at least one year of graduate internship or laboratory work. Residence three years. Stipends \$840 each year.

3. *Fellows or similar appointees of other institutions* may be accepted for periods of one year or more for graduate work in any of the above mentioned fields. No stipends.

Appointments are made approximately six months in advance for residence beginning January 1, April 1, July 1, October 1. Work may lead to the degree of Master of Science or of Doctor of Philosophy.

For further information, address

The Director of the Mayo Foundation,
Rochester, Minnesota

THE FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION

No. 1, Wimpole Street, London, W. 1.

with which is associated some 50 General and Special Hospitals in London, is prepared to offer the following facilities to qualified practitioners:

- I General Courses are arranged covering all branches of Medicine and Surgery. These Courses occupy the student for several hours every day and last for two weeks.
- II Rota of teachers, giving personal tuition at hospital clinics, is arranged and full details are available on application.
- III Special Courses are arranged at the Special Hospitals associated with the Fellowship, and permit of intensive study in one specialty for a period ranging from 1 week to one month.

Provisional Courses in 1936.

Chest Diseases (Week-end Course)	Mar. 7 & Mar. 8.—Brompton Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.					
Orthopedics	Mar. 9 to Mar. 21.—Royal National Orthopedic Hospital. All day. Fee £3. 3s. 0d.					
M.R.C.P. (Chest)	Mar. 9 to Apr. 4.—Brompton Hospital. Two afternoons weekly, 5 to 6.20 p.m. Fee £3. 13s. 6d. (Limited to 6 per class).					
Clinical Surgery (Week-end Course)	Mar. 14 & Mar. 15.—Royal Albert Dock Hospital. All day. Sat. and Sun. Fee £2. 2s. 0d.					
*M.R.C.P. (Chest and Heart) (Evening Course)	Mar. 16 to Apr. 4.—Royal Chest Hospital. Mons., Weds. and Fris., 8 to 10 p.m. Fee £4. 14s. 6d. (Non-members £5. 15s. 6d.)					
F.R.C.S. (Final) (Evening Courses)	<table><tr><td>Mar. 17 to May 5</td><td rowspan="3">{</td><td rowspan="3">National Temperance Hospital. Tues. and Thurs. at 8.00 p.m. Two separate Courses. Clinical and Pathological. Fee £7. 7s. 0d. each course. (Maximum of 25 in each course.)</td></tr><tr><td>Mar. 19 to May 7</td></tr><tr><td>(excluding Easter Holidays)</td></tr></table>	Mar. 17 to May 5	{	National Temperance Hospital. Tues. and Thurs. at 8.00 p.m. Two separate Courses. Clinical and Pathological. Fee £7. 7s. 0d. each course. (Maximum of 25 in each course.)	Mar. 19 to May 7	(excluding Easter Holidays)
Mar. 17 to May 5	{	National Temperance Hospital. Tues. and Thurs. at 8.00 p.m. Two separate Courses. Clinical and Pathological. Fee £7. 7s. 0d. each course. (Maximum of 25 in each course.)				
Mar. 19 to May 7						
(excluding Easter Holidays)						
Medicine (Week-end Course)	Mar. 21 & Mar. 22.—Miller General Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.					
Infants' Diseases	Mar. 23 to Apr. 4.—Infants' Hospital. Afternoons. Fee £3. 3s. 0d.					
Ophthalmology	Mar. 23 to Apr. 4.—Royal Eye Hospital. Afternoons. Fee £1. 1s. 0d.					
Urology (Week-end Course)	Mar. 28 & Mar. 29.—All Saints Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.					
April 13th, EASTER MONDAY.						
Heart and Lungs (Week-end Course)	Apr. 18 & Apr. 19.—Victoria Park Hospital. All day. Sat. and Sun. Fee £1. 11s. 6d.					
Proctology	April 20 to April 25.—St. Mark's Hospital. All day. Fee £3. 3s. 0d.					
Psychological Medicine	April 27 to May 30.—Maudsley Hospital. Afternoons. Fee £5. 5s. 0d.					
Medicine, Surgery and Gynaecology	April 27 to May 9.—Royal Waterloo Hospital. All day. Fee £3. 3s. 0d.					

* Open to non-members.

Copies of all Special Course syllabuses and of the General Course Program may be obtained on application. The Hospitals reserve the right to make any alterations necessary in dates and fees. Post-graduates are advised, therefore, to make early enquiry. Other courses are arranged from time to time, in addition to the above list.

Courses are open only to Members of the Fellowship of Medicine; the annual subscription (from the month of joining) is £1. 1s. 0d., which includes the subscription to the *Monthly Post-Graduate Medical Journal*. Overseas subscription, to the *Journal* only, is 12/- per annum, post free. Every effort is made to assist Members to obtain the post-graduate work they require.

H. U. MORLOCK, M.C., M.D., M.R.C.P.,

DAVID LEVI, M.S.

Honorary Secretaries

Prescribe

EFEDRON (HART)*For Relief of Nasal Congestion*

*The original water
soluble Ephedrine Nasal
Jelly.*

*Patients appreciate the
convenience and quick
relief it affords.*

**Send for FREE
TUBE—TODAY**

Laurentian Laboratories, Limited,
560 De Courcelles Street, St. Henry, Montreal.

Please send me complimentary tube EFEDRON
(Hart) for clinical trial.

.....M.D.

*For Metabolism Studies and
Oxygen Therapy*

SODASORB*(An improved type of Wilson Soda Lime)***THE BEST ABSORBENT FOR CARBON DIOXIDE**

For the past ten years, Wilson Soda Lime has been recognized by leading hospitals in America as the outstanding CO₂ absorbent for use in metabolism apparatus and the oxygen tent. Sodasorb, made according to the original Wilson formula, possesses all of the outstanding advantages of Wilson Soda Lime and in addition is even more efficient as an absorbent.

**NON-DELIQUESCENT
MOST ECONOMICAL
MOST EFFICIENT
MOST ACCURATE**

Please Write For Further Details

DEWEY & ALMY CHEMICAL CO.
of Canada Ltd.

Sales Offices and Warehouses:
National Terminal Bldg. - Montreal, Que.
Factory: Farnham, P.Q.

**Simultaneous transillumination of BOTH-Sinuses,
Eyeballs, Pupils, etc.**

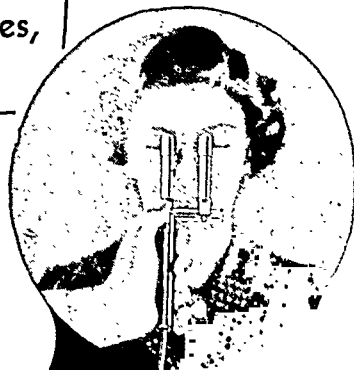
National
(Patent applied for)

TWIN-TRANSILLUMINATOR

For greater ease and accuracy in comparison diagnosis, you'll find nothing better than this new Twin-Transilluminator. It eliminates the old "single-sinus" method of transillumination and enables you to see BOTH sinuses at the same time. Uses standard flashlight bulbs. Also excellent for eyeball, antrum, mastoid, breast and hydrocele diagnosis. Complete . . . \$13.75. Your dealer will tell you more about it and also about the NEW Simplified Control Caution with the "Hidden Shelf."

National Elec. Instr. Co.

LONG ISLAND CITY, N.Y.



**Simultaneous
Sinus Transillumination**

IN WHOOPING COUGH
And in other Persistent Coughs
ELIXIR BROMAURATE

Cuts short the period of the illness, reduces the frequency of the attacks, relieves the distressing cough and gives the child rest and sleep.

Also valuable in BRONCHITIS and
BRONCHIAL ASTHMA

(Relieves the cough in Pulmonary Tuberculosis)
IN FOUR-OUNCE ORIGINAL BOTTLES—A teaspoonful
3 to 4 times a day after meals or more often when
necessary.

DOCTOR, TRY THIS GOLDEN ELIXIR

NOTE:—An interesting booklet on "Gold in the Treatment of Whooping Cough and Other Diseases" is just off the press and may be had on request. Drop us a card.

GOLD PHARMACAL CO.

NEW YORK



**F. & R.'s
GENUINE
GLUTEN FLOUR**



Guaranteed to comply in all respects to standard requirements of the U.S. Department of Agriculture.

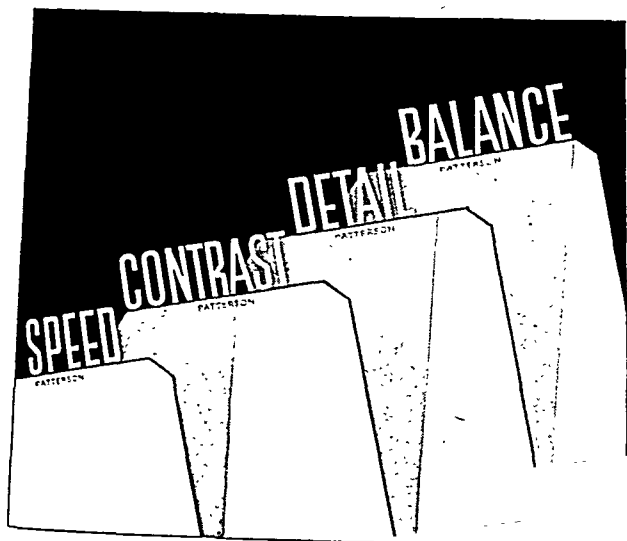


Manufactured by
THE FARWELL & RHINES CO.
Watertown, N. Y., U.S.A.



Give your Skill Full Play

... by using a Patterson Intensifying Screen
exactly suited to each technique requirement.



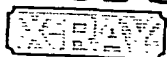
WITH the proper screen equipment available in his office the doctor is able to more fully adapt his skill and technique to the requirements of each individual situation. This is why Patterson makes available to you Intensifying Screens in a comprehensive variety of types, from which you can always choose exactly the screen best suited to your needs.

- (1) HI-SPEED COMBINATION: ★ For exceptional speed over all voltage ranges. Admirable balance between speed and detail.
- (2) PAR-SPEED COMBINATION: ★ A less expensive screen for general radiography where screen speed is not the primary consideration. Excellent contrast and detail.
- (3) DETAIL COMBINATION: For use where detail is paramount and speed is secondary. Gives operator full advantage of fine focus tubes.
- (4) FLUORAZURE COMBINATION: For the occasional exceptionally difficult case where very high speed is the primary requirement.

★ The Hi-Speed and Par-Speed Combinations are for general routine work. They meet a very wide variety of needs and constitute the "backbone" of laboratory screen equipment.

THE PATTERSON SCREEN COMPANY
Dept. C.M.A.J. Towanda, Penn., U. S. A.

Patterson



INTENSIFYING **Screens** FLUOROSCOPIC

SCREEN SPECIALISTS FOR MORE THAN 20 YEARS

Fast— Superior in Detail— Uniform!



BRITISH MADE

Ilford X-Ray Film

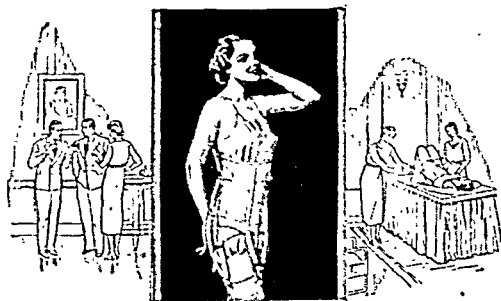
has received the stamp of approval of leading roentgenologists, who judge an x-ray film by its ability to produce good, clear, diagnostic radiographs CONSISTENTLY.

Complete stocks carried by

VICTOR X-RAY CORPORATION
of Canada, Ltd.

Distributors for General Electric X-Ray Corporation

TORONTO—30 Bloor St. W., Toronto, Ont. • MONTREAL—524 Medical Arts Bldg. • VANCOUVER—Motor Transportation Bldg. 570 Dunsmuir St. • WINNIPEG—Medical Arts Bldg. Wholesale Warehouse 389 St. Paul St. W., Montreal, P. Q.



CONSIDER THIS MATTER OF SUPPORT

MANY physicians agree that there are certain situations in which the muscles and connective tissues are unable to do their work, as for instance—in some cases of pregnancy, visceroptosis, hernia, sacro-iliac disturbances, postoperative conditions and the like. When either abdominal or back support is deemed by the physician requisite to a return to physiologic balance... and a fabric garment is prescribed for this purpose... the great difficulty—it will be admitted—is to secure supports that are scientifically constructed, reasonably priced and properly fitted to the individual. It has been the definite objective of S. H. Camp and Company for over a quarter of a century to manufacture supports with these qualifications.

The attainment of these three desiderata has involved many busy years of research and collaboration with leading surgeons, gynecologists, obstetricians, internists and orthopedists. To heed the stern dictates of eminent physicians for trial and retrial, to adhere to Camp standards of quality of merchandise and workmanship, and at the same time to keep manufacturing costs—and therefore retail price—within reasonable bounds has represented an achievement of no mean proportions.

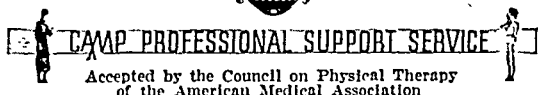
To insure the proper fitting of supports, to acquaint the profession with Camp models and to keep both physicians and fitters apprised of new garments, it has been necessary to establish the Camp Professional Support Service. With the development of this Service and the excellence of Camp Supports has been won the approval of such organizations as the American Medical Association and the American College of Surgeons.

In the announcements which are to be featured this year, we propose to explain in detail the various phases of the Camp Professional Support Service... and how each factor in the Service helps to solve this matter of supports and to provide garments which are scientifically constructed, reasonably priced and properly fitted to the individual.

S. H. CAMP & COMPANY of CANADA, Ltd.

Manufacturers

Windsor, Ontario, Canada



Accepted by the Council on Physical Therapy
of the American Medical Association

WHOOPING COUGH

The Paroxysmal Stage

R Vapo-Cresolene (specially prepared cresols of coal tar) sedative, antiseptic, antispasmodic, penetrating.

Vaporized at night to relieve the paroxysms at that time; the strength of the patient will be conserved.

An inhalant of known dependability. Introduced in 1879.

Controls cough in broncho-pneumonia and bronchitis. Dyspnoea in spasmodic croup and bronchial asthma.



Write for special discount to physicians and informative Treatise, "Effective Inhalation Therapy."

THE VAPO-CRESOLENE CO.

504 St. Lawrence Boulevard, Montreal

Name

Street

Address

THE PAVAEX UNIT—ITS USE

Passive Vascular Exercise (Pavaex Therapy) is a mechanical means of actively promoting the development of an adequate collateral circulation after the major or secondary arterial pathways have been obliterated by trauma or disease. This method consists of the rhythmic alternation of negative and positive pressures about the affected extremity after it has been placed in a sealed boot of Pyrex glass. The treatment reduces the peripheral resistance to the flow of blood through the smaller arteries and arterioles, as well as rhythmically stretching the walls of the smaller arteries to permit a greater quantity of arterial blood to reach the distal portion of the affected extremity. The Pavaex (Passive Vascular Exerciser) Unit is the product of many months of intensive engineering research based upon the clinical and experimental researches during the past three and one-half years, which have been carried out in the University of Cincinnati. More than 60,000 hours of passive vascular exercise (Pavaex) treatments have been given to more than 300 patients with extensive obliterative diseases of the peripheral arteries. The most startling results have been observed in those who are suffering from a more or less sudden occlusion of one of the major arteries of an extremity. It has been found that the greatest increase in circulation with the least damage to the delicate tissues is accomplished by approximately 90 mm. of mercury below atmospheric pressure (negative) and 20 mm. of mercury above atmospheric pressure (positive). For patients who are hospitalized the number of hours of actual treatment varies from 4 to 8 each day, while the less urgent and ambulatory patients receive from 12 to 20 hours of treatment each week. (Taylor Instrument Co.—Adv.)



"Gentlemen, it is with pride in our profession that I tell you of my difficulty in getting clinical material to illustrate our discussion of rickets. Twenty years ago . . ."

THE above picture was suggested by a situation arising at a recent medical meeting attended by thousands of physicians. Their comments revealed a country-wide decrease in the incidence and severity of rickets, the result of clinical application of modern developments in the science of nutrition.

Three minims of Haliver Oil with Viosterol, in a tasteless gelatin capsule, or delivered from

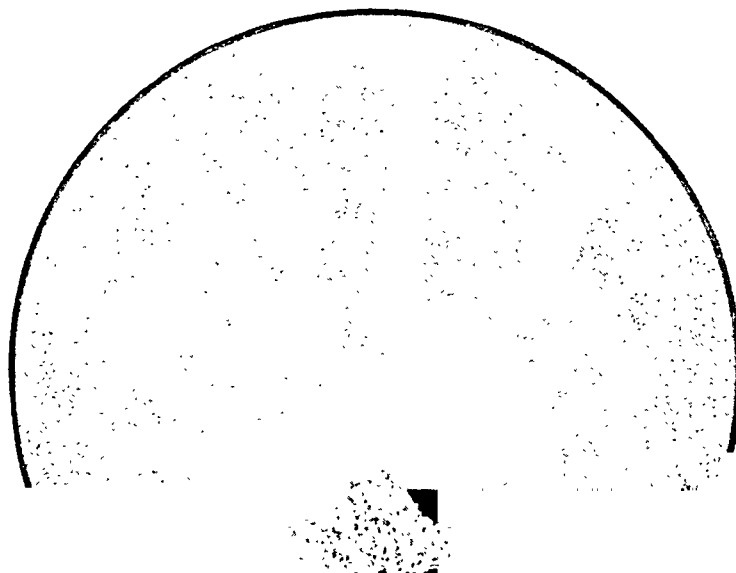
a dropper, provide at least as much vitamin A and vitamin D as four teaspoonfuls of Cod-Liver Oil (minimum International standards).

Parke-Davis Haliver Oil with Viosterol has a vitamin A activity of not less than 50,000 International units per gram; and vitamin D activity of not less than 10,000 International units per gram.

Parke-Davis Haliver Oil with Viosterol is available in 5-cc. and 50-cc. amber bottles with dropper, and in boxes of 25 and 100 three-minim gelatin capsules.

PARKE, DAVIS & COMPANY • Walkerville, Ontario

No. 25 of a Series of Advertisements Prepared in the Interest of Acetanilid B.P. by Bromo-Seltzer Ltd.



**Maximum Analgesic
Effect With Minimum Dose
ACETANILID
IN SYNERGISTIC COMBINATION**

A CETANILID has demonstrated its outstanding value in the relief of pain. Many physicians choose it as their No. 1 analgesic. A great number of the profession prescribe acetanilid and acetphenetidin in combination with their synergists caffeine and bromides . . . for more rapid action . . . and for maximum effect with minimum dose.

- The relative non-toxicity of acetanilid and acetphenetidin has been frequently cited in the literature. The lower dose required when they are used with caffeine and bromides make them doubly safe.

- Acetanilid and acetphenetidin act to relieve pain by blocking the synapses and preventing the pain impulses from reaching the higher centres. A scientifically proportioned combination containing acetanilid and acetphenetidin with caffeine and bromides may now be had in an inexpensive, effervescent pharmaceutical. Citrates add zest and valuable alkalization.

BROMO - SELTZER LTD.

TORONTO

•

CANADA

Generous trial supply and literature sent upon request



"Prevention and cure of teeth and bone deficiencies are the principal purposes underlying the widespread interest in adding vitamin D to milk. Rickets, a common and serious bone weakness developing in infancy and early childhood, can be prevented or remedied promptly by means of this vitamin, and a large percentage of children do not derive the needed amount of vitamin D from ordinary food, especially when they are deprived of sufficient sunshine." WISCONSIN STATE BOARD OF HEALTH BULLETIN, January-March, 1935.

THE ANSWER TO A NEED

THE irradiation of Carnation Evaporated Milk, adding a vitamin D potency sufficient to prevent rickets in the average normal infant, is a step predicated on a long series of observations by the medical profession of the prevalence of rickets and the lack of vitamin D in common foods. Irradiated Car-

nation Milk is a dependable source of this vitamin—universally available, and so economical that no section of our population need now be deprived.

The Dionne Quintuplets are using Irradiated Carnation Milk. They started to get it in November, 1934.

CARNATION CO. LIMITED
TORONTO - ONTARIO



C IRRADIATED
Carnation
Milk

"from Contented Cows"

WRITE FOR "Simplified Infant Feeding," a new and authoritative publication for physicians.

A CANADIAN PRODUCT

Dry Cough or Congestive?

Expectorants are of special utility when they give the physician a latitude of choice.

Creo-Terpin Comp. is a "stimulant" expectorant combining creosote and terpin hydrate in fluid form for relief of excessive respiratory secretion.

Bronchoids are a "stimulant" expectorant in capsules, embodying creosote, terebene and eucalyptol for relief of congestive cough.

Sanguinaria Comp. combines "emetic" expectorants for promotion of secretion and relief of dry cough.

Samples for clinical trial free to physicians

HENRY K. WAMPOLE & CO. LTD.

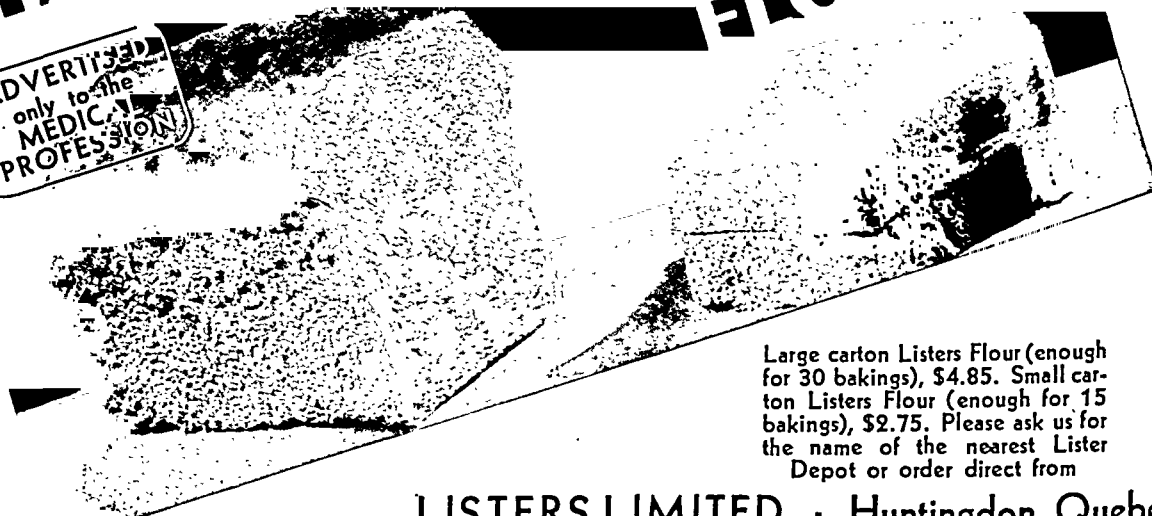
Manufacturing Pharmacists

PERTH, ONTARIO, CANADA

For
DIABETES

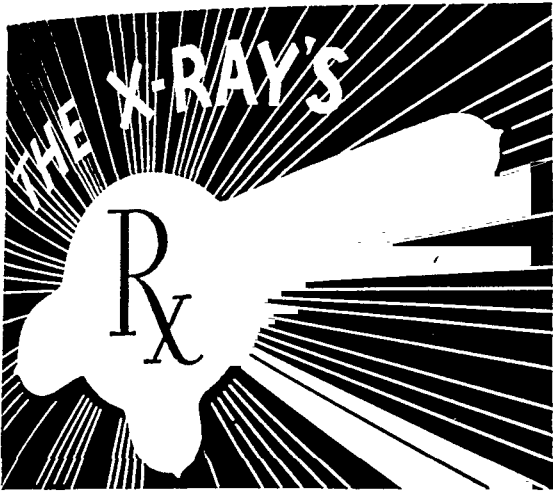
STARCH-FREE BREAD
FOR DIABETICS—EASILY MADE AT HOME
FROM **LISTERS**
STARCH-FREE
FLOUR

ADVERTISED
only to the
MEDICAL
PROFESSION



Large carton Listers Flour (enough for 30 bakings), \$4.85. Small carton Listers Flour (enough for 15 bakings), \$2.75. Please ask us for the name of the nearest Lister Depot or order direct from

LISTERS LIMITED • Huntingdon, Quebec



"Use an Atomizer"

- We wanted to see just what happens mechanically when medication is applied to the nose and throat. So we had X-rays made showing the effects of application of barium by dropper, gargle and atomizer.
- The X-ray plates indicate that for complete coverage of the nasal passages or for the mucous membranes in the pharynx and larynx, spraying is more effective than the dropper or gargle.
- We feel sure that you will be interested in the details of these tests, and will be glad to send you full information if you so request.



DeVilbiss No. 15 for antiseptic solutions.



DeVilbiss No. 14 for use where only a fine spray or small volume of solution is required.

DeVilbiss

The DeVilbiss Mfg. Co., Limited, Windsor, Ontario, headquarters for atomizers and vaporizers for professional and home use

● Palatable... and non - irritating . . . in the treatment of coughs . . . grippe . . . and bronchitis

There is never any reluctance on the part of children or adults in taking Liquid Peptonoids with Creosote. It is palatable, non-irritating and can be retained by the most sensitive stomach. Clinical test will prove the value of this product as a bronchial expectorant and sedative. The coupon will bring samples and literature.

Liquid Peptonoids with Creosote

THE ARLINGTON
CHEMICAL CO.
YONKERS, NEW YORK



W. LLOYD WOOD, LIMITED.
Canadian Agent.

64-66 Gerrard St. E., Toronto C.M.J.-2-36

You may send me at the address below
a sample of Liquid Peptonoids with Creosote.

Dr. _____

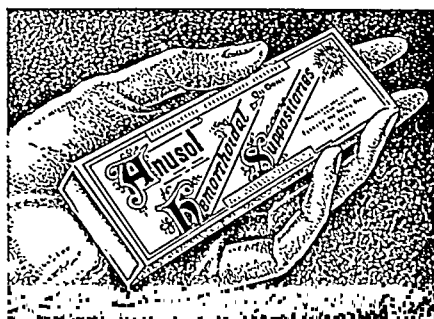
Address _____

City _____ Prof. _____

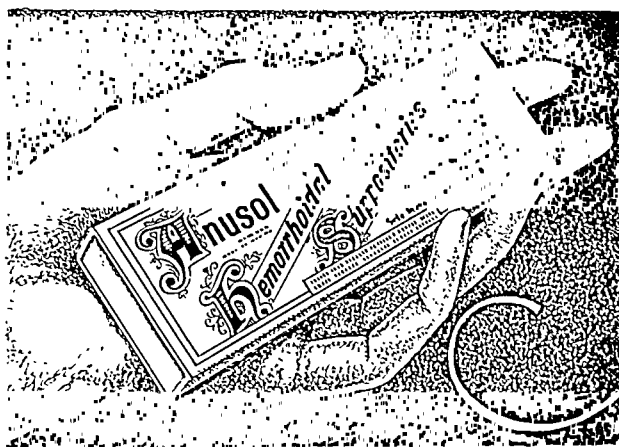
Defecalgesiophobia



The dread of defecation because of pain is the starting point in the vicious circle of hemorrhoids. It results in constipation, and constipation favors hemorrhoid formation. The use of Anusol Suppositories obviates this "fear-constipation." By softening the contents of the rectum and lubricating the channel of their passage, these suppositories make evacuation easier and painless.



But that is not the only accomplishment of Anusol Suppositories in the treatment of hemorrhoids. They aid in reducing the congestion that causes pain and discomfort. In this way, the circulation is improved in the affected parts, and bleeding is more easily controlled. All this is accomplished without narcotic, analgesic or anesthetic drugs, without belladonna, ephedrine or epinephrine.



*Anusol Suppositories are supplied in boxes of 12.
Send for a complimentary trial supply.*

Anusol

WILLIAM R. WARNER & CO., LTD., 727 King Street, West, Toronto, Ont.

ERGOAPIOL (SMITH)



A GOOD PRESCRIPTION

Physicians throughout the world prescribe ERGOAPIOL (Smith) in the treatment of *Amenorrhea*, *Dysmenorrhea*, *Menorrhagia* and *Metrorrhagia*.

ERGOAPIOL provides symptomatic benefit by stabilizing uterine tone, regulating innervation and controlling bleeding when present. By its corrective action on perverted menstrual function, it simplifies local gynecological treatment. Valuable in obstetrics during the third stage.

Our ethical protective mark MHS embossed on the inside of each capsule, *visible only* when capsule is cut in half at seam, affords the physician a ready means of determining whether his prescription has been correctly filled.

DOSAGE: One to two capsules three or four times a day, preferably after meals with a glass of milk or water.

Supplied only in packages of twenty capsules each.

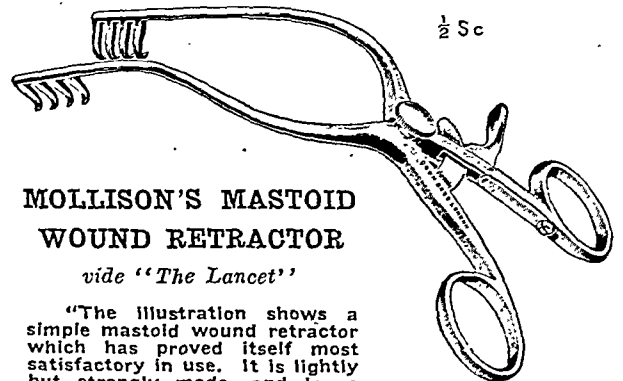
Formula and descriptive literature on request.

MARTIN H. SMITH CO...150 LAFAYETTE ST...NEW YORK CITY

MOLSON'S ALE

FAMOUS FOR PURITY
AND WHOLESOMENESS

SINCE 1786



MOLLISON'S MASTOID WOUND RETRACTOR

vide "The Lancet"

"The illustration shows a simple mastoid wound retractor which has proved itself most satisfactory in use. It is lightly but strongly made, and is so curved that when the jaws are in position the shafts and handle lie conveniently against the head of the patient out of the way. It is fitted with a cam ratchet, which maintains the jaws at any desired width with delicacy and rigidity. The instrument, which can be taken apart at the joint, is made of stainless steel so as to withstand repeated sterilizations without damage."

DOWN BROS. LTD.

(London, Eng.)

143 College Street, Toronto

Manufacturers of
SURGICAL INSTRUMENTS
and
HOSPITAL EQUIPMENT

Sole Agents in Canada for:—

London Hospital Catgut.

James Swift's Microscopes.

Rayner's Optical Instruments.



INSTANTANEOUS
RELIEF
in
ASTHMA

is now possible with Endophrin Inhalant, the new 1 per cent. solution of epi-nephrine hydrochloride. Endophrin is a potent and rapidly acting antispasmodic. Dose: From 2 to 10 min. volatilized in an all-glass atomizer and inhaled through the mouth, p.r.n. Available in ¼-oz. dropper bottles.

Prescribe **ENDOPHRIN INHALANT**

in all forms of ASTHMA. Literature and testing supplies to physicians on request.

The HARROWER LABORATORY, Inc.

Canadian Distributors:

WILFRED G. NOBLE, LTD.

64 Gerrard St. East - Toronto 2



NO CAFFEINE?

"You'd never know it!"

Pretty hard, isn't it, Doctor, to get coffee-loving patients to mind your "no-caffeine" orders? Wouldn't it help to explain that it's *only* the caffeine in coffee that causes trouble . . . that if they'll just switch to Kaffee-Hag Coffee (97% caffeine-free) they can drink as many cups as they like?

They *will* enjoy this coffee, too . . . because Kellogg's new process takes 97% of the caffeine out, and leaves *all the flavour*. Rich, mellow and satisfying. A superb blend of finest Brazilian and Colombian coffees.

Why not try Kaffee-Hag Coffee in your own home . . . and discover, for yourself, its fine flavour!

A professional sample will be sent to you upon request.



Kellogg's Kaffee-Hag Coffee is accepted by the American Medical Association with the statement: "Kaffee-Hag is free from caffeine effect, and can be used where other coffee has been forbidden."



KELLOGG COMPANY OF CANADA, LIMITED
London, Ontario

In your stubborn cases of

ECZEMA PSORIASIS ALOPECIA
RINGWORM DANDRUFF ATHLETE'S FOOT

cases which utterly fail to respond
to the usual treatments,
make use of

MAZON
FOR ECZEMA

DISTINCTLY MODERN

Not a smear! There is no greasy residue. Mazon is completely and rapidly absorbed.

No Bandages! Permit air to act freely. Allays itching immediately. Will not stain.

Economical! Permanency of results establishes Mazon as an effective and economical treatment.

The pictures tell the story.



Photographed Feb. 9, 1935

Photographed Feb. 22, 1935

COMPLETE ELIMINATION—13 days.
NO RECURRENCE—1 year.

MAZON SOAP

an important factor of Mazon treatment, cleanses and properly prepares the skin for the absorption of Mazon. Therapeutically balanced and absolutely pure. Contains no free alkali, excessive oils or greases, nor is it synthetically perfumed or artificially colored.

We Want You to Learn of Mazon's Merits
Test it on your most refractory suitable skin case.

On Sale Distributors
Dependable Pharmacies Wholesale Druggists

Samples and literature on request

LAURENTIAN LABORATORIES, LTD.
560 DeCourcelles St.
Montreal, Que.

C-38

Gentlemen: Please send me **FREE** trial supply of Mazon and Mazon Soap.

Dr.
Address
City Prov.

COUGH

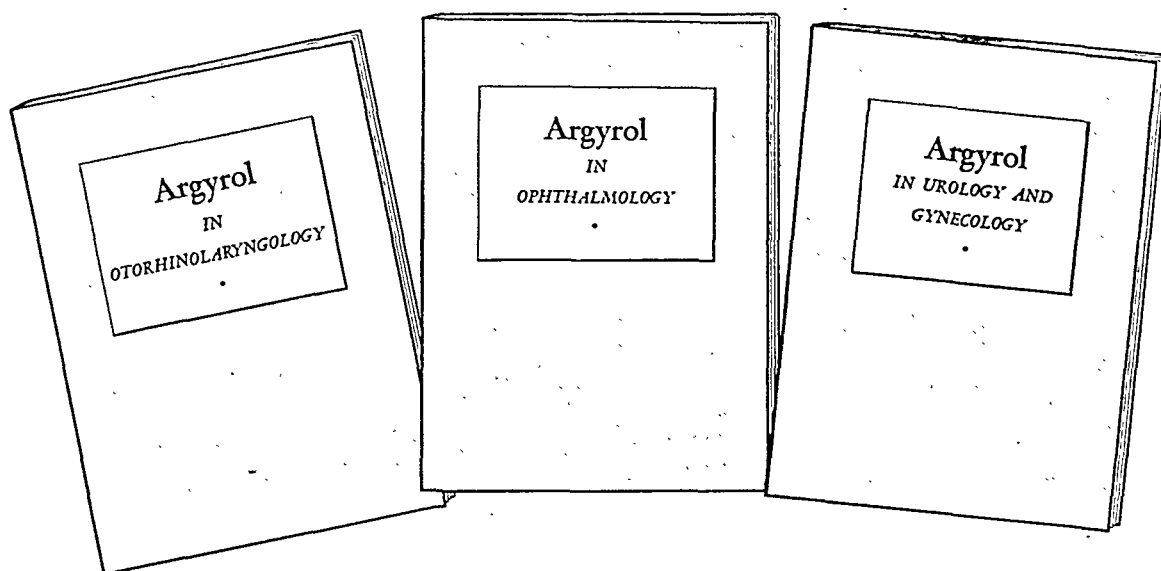
A PAINFUL and troublesome cough, whether associated with Tracheitis, Laryngitis, Pharyngitis, with Bronchitis, Pleurisy or Pneumonia, when treated with Antiphlogistine, applied as hot as the patient can comfortably bear, is usually attended with the happiest results.

Following its use, the congestion tends to decrease and the respiration to ease, while the cough becomes looser and less painful.

ANTIPHLOGISTINE

Sample on Request

THE DENVER CHEMICAL MFG. CO.
153 Lagauchetiere St. W., Montreal



These Three Booklets

epitomize the experience of many specialists and clinicians over a period of thirty years

THESE booklets were prepared by competent medical authority, and have just been issued in compact form. Any of them (or all three) will be sent on request to any practitioner *with the compliments* of the makers of Argyrol.

For over thirty years, Argyrol has been highly esteemed by the medical profession, and during these years it has achieved recognition in all parts of the civilized world. In

their respective fields, these booklets constitute, in effect, a brief but comprehensive résumé of world-wide, practical Argyrol experience on the part of specialists and clinicians.

We believe you will find these booklets absorbingly interesting from a professional standpoint, and most useful in your regular practice. A coupon is provided for your convenience in requesting these informative booklets.

*Argyrol is now made in Canada by
A. C. Barnes Company Ltd., Ste. Therese, P.Q.*

A. C. BARNES COMPANY, LTD.
Ste. Therese, P.Q., Canada

Please send me *complimentary* copy of the following booklets:

- ☐ Argyrol in Ophthalmology
- ☐ Argyrol in Otorhinolaryngology
- ☐ Argyrol in Urology and Gynecology

NAME

ADDRESS.....

CITY OR TOWNPROVINCE.....

PNEUMONIA DEATH RATE

CUT 77% . . . with SHERMAN VACCINE

Formula "38"

**CLINICAL TESTS COVERING
EIGHT YEARS ON 956 CASES
DISCLOSE THESE STRIKING
RESULTS . . .**

Conducted By One of America's Most Renowned Clinicians

One of America's most eminent physicians set himself the task of making the most exhaustive tests on the efficacy of vaccine in the treatment of pneumonia. His work was complemented by several prominent clinicians in other parts of the United States. The variety of pneumonia types treated was so varied, the period of eight years' time so extensive and the results so uniformly dramatic that the findings disclosed "must certainly rule out as much as possible the element of chance."

*Findings Published in Bulletin of New York Academy of Medicine**

A complete review of the comparative tests of vaccinated and control cases treated together with a resume of the procedure, dosage, therapeutics and results on 956 cases used for observation provide a very impressive brief for the use of vaccine in the treatment of pneumonia.

Bellevue Hospital the Proving Ground

The extensive clinical work necessary to secure the impressive findings in this research was conducted at the

Bellevue Hospital, New York City. These findings are set forth in a condensed chart on this page. Concurrent clinical tests were likewise pursued at the Cook County Hospital by several very eminent physicians in Chicago and the results paralleled those in the east with startling exactness.**

Conclusions:

In eight years' time 474 patients with various types of pneumonia were treated with Sherman Pneumococcus Combined Vaccine Formula "38" at varying periods of

time after the onset of the disease. These were compared with 482 controls. Result: Treatment commencing in the first 48 hour period reduced the death rate 77%. Where treatment, commenced within first 72 hour period the death rate was reduced 59%. And in all other cases treated after 72 hours the death rate was reduced 32%. It is clear that a considerable premium is placed on the immediate stimulation of the protective mechanism of the body by injections of a proved vaccine.

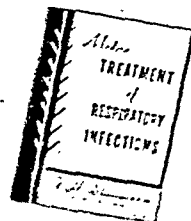
	VACCINATED		CONTROLS	
	Total	Died	Total	Died
Cases treated in first 48 hours	97	9	97	39
Cases treated in first 72 hours	107	17	115	45
Cases treated after 72 hours	270	89	270	131
Total cases treated	474	115	482	215

*Lambert, Alexander: Bulletin, New York Academy of Medicine, June, 1933.

**Sutton, Don: Illinois Medical Journal, April, 1927.

Free to Physicians

This special book on the Modern Treatment of Respiratory Infections, including a digest of the papers referred to above, together with a 5 cc. vial of Sherman Pneumonia Vaccine Formula "38" mailed free on request.



G. H. Sherman, M.D., Inc.

Bacteriological Laboratories
14614 E. Jefferson Ave., Detroit, Michigan

G. H. Sherman, M.D., Inc.,

14614 E. Jefferson Ave., Detroit, Mich.

**PLEASE
USE THIS
COUPON**

Please send me free 5 cc. vial of Sherman Pneumonia Vaccine Formula "38" with special book on the Modern Treatment of Respiratory Infections.

Doctor _____
Address _____
City _____

Print Name _____